EDUCATIONAL REVIEW

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I

TO A YOUNG FRIEND GOING AWAY FROM HOME TO GET AN EDUCATION[1]

My dear Friend:

A good many years ago I did what you are doing now. Since then, things have changed a little in our American schools and colleges. The term opens later in the fall and closes earlier in the summer. Students' rooms are finer and warmer. "Entrance requirements" are larger and stiffer. Tallow candles have gone out, electric lights have come in, and even kerosene oil has been refined to astral brilliancy. You are going to have more teachers, more elective courses, more expenses, more athletic trainers, more "modern advantages," including probably more kinds of food, than I had. But, after all, these changes do not make any real difference in the meaning of the fact that you are going away from home to get an education. Your outfit may be better than mine, and the road may be a bit smoother; but you are starting on the same journey, and you have to face the same question: What goal are you going to make for, and how are you going to travel, straight or crooked?

To answer this question rightly you must, first of all, remember that you are now a member of a privileged class. You are old enough to earn your own living. Under ordinary conditions, you would have to do it. But you are going to be exempt from that necessity, in all probability, for four years, seven years, ten years—as long as it may need to complete

[1]Reprinted, by permission, from *The Churchman*, August 15, 1903.

your course. During all that time you will be let off from the common duty of taking part in the world's work. Even if you should do something to help pay the expenses of your education by laboring in vacation and between times, you would give far less than you would get; and the opportunity to do at least that much has been made possible only by the generous benefactions and endowments of unknown friends.

Yes, you owe it to yourself to look the fact in the eyes. You are a person set apart; a guest at the world's table; a consumer, not a producer. No one will ask you what your trade or your business is. All that will be asked of you is how you are getting on with your education. You will be permitted to devote all your time and energy to yourself, and somebody else will pay for your living.

Who is going to do this generous thing for you? Well, a good many people will have a share in it. First of all, your parents will do the greater part of it. You know something of the sacrifices and gifts that they will have to make in order that you may enjoy your years of privilege and opportunity. Then, the community to which they belong has a part, indirectly, in making it possible for them to give you an education. Then, the people who have given the money to found institutions of learning and keep them going for the sake of you and others like you, contribute directly to your benefit. Then, the great army of teachers who are spending their lives in hard work for small pay make an offering on your behalf. Finally, the State, the Nation, by its appropriation of public money for educational purposes (which are all really bound together and interdependent), makes you its beneficiary.

Now, your own sense of honor must tell you, at once, that you cannot fairly accept such benefits as these without incurring great obligations. Why have these people put you into a privileged class? Why does the world, in effect, agree to pay for your living while you go on with your education? The question comes up to you.

The answer is plain and straight. The world pays for your living in order that your life, thru education, may become of more value to the world. That is the essential fact,

the point of honor, which you must never forget. You are taken care of and provided for during a period of years when you are (or at least you ought to be) able to provide for yourself, with the definite design that your intelligence, your character, your purpose and power of doing good work may be so developed that you may be worth more to your fellow-men than you are now—and worth enough more to pay for what it is going to cost to educate you. If you accept your place in a privileged class on this condition, it is all right. You are not an idler, a burden, a pauper. You are an investment. But if you take the privilege and refuse or dishonor the obligation, you are an object of misplaced charity, a cheat, a fraud.

What you have to do, then, is to make up your mind that you will get out of your education the thing for which it is given to you—a richer, fuller, stronger life, of which the world shall receive the benefit.

I do not think that it is your business just now to invent a new plan and devise all the means for securing this result. On the contrary, I think that if you try to work out an original educational method and course for yourself you will probably waste a good deal of time—which, as I have just reminded you, is money, and other people's money, too. The general scheme and system of education, with the improvements suggested by experience, and the variations needed to adapt it to different individuals, is there waiting for you. If you are wise, you will put yourself into it, not with flabby indifference, nor with blind resignation, but with the clear and steady purpose of making it give you just as much as possible for the training of your mind and for the increase of your power as a person and of your worth as a member of society.

Take your studies as they come, but make them count for something before they go. They will be of two kinds: those that you like, and those that you dislike. Use the former to develop your natural gifts, and the latter to correct your natural defects. There is a great difference in minds. Some are first-class, some are second-class, and so on. You can never tell what kind of mind you have got unless you test it thoroly by hard work. Even if it should appear to be second-

class, do not be discouraged. A second-class mind well cultivated will yield a great deal more than a first-class mind left fallow. All that you have to do is to make your own garden (not some other man's) give the best crop of which it is capable. Examinations and grades and classroom marks are "government crop estimates." As a rule, they are fairly accurate. But, after all, it is not the estimate, but the crop itself that comes to market and feeds the world. You know what you have learned. And you have learned just as much as you know.

Make your friends with a purpose of enlarging your life, your tastes, your sympathies, your hopes. Follow your inclinations in forming acquaintances, but keep your eyes open, and see where they are leading you. Unless you enjoy a friendship it is not likely to be of much good to you. But, on the other hand, unless it really does you good, your joy in it will soon grow barren, or turn to pain. Have some friends to whom you look up, and some who look up to you. Be a grateful receiver as well as a generous giver. Let the secrets you share with your friends be such as will make you not ashamed, but glad, to look deeper into each other's eyes.

Play the out-of-door games that suit you and give you honest pleasure. They will suffice to give you all the physical training that you need. The object of athletic sports among amateurs is twofold: first, to relax and amuse the mind; second, to keep the body in good condition for the real work of life—which is not athletic sports. There is no advantage in cultivating more muscle than you are likely to have any use for unless you are going to be a professional athlete. On the contrary, it is a burden and a danger. What you want is a body that will be a ready, cheerful, and capable servant to your mind.

Do not starve or neglect the spiritual side of your nature. The best and wisest men of the world have all agreed that a full and noble life is not possible for man without religion. It would be a poor outcome for you and for the world if your education should end in that half-knowledge which, as Lord Bacon says, tends to atheism. But even atheism, it seems to

me, is better than the dead and dry religion which exists without praise, without good works, without personal prayer. Give your best thought, your deepest feelings to the subject that means most—the true and immortal life that is brought to light in Jesus Christ.

A hundred questions, and some of them very perplexing, are sure to meet you as you go on with your education. Do not try to anticipate them. Do not try to answer them now. Let yourself go, with a good heart and a cheerful courage, into the course that opens before you. Take your privilege with its obligations. Let the world pay for your living now. But make sure that your education fits you to pay the world back for all you have received, in a life equipped and disciplined for fine service among men.

Faithfully yours,

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II

THE SEPARATION OF THE CHURCH FROM THE TAX-SUPPORTED SCHOOL[1]

The question of religious education in the schools supported by public taxes is not the question of the importance of religion, but the question of the most fitting occasion for efficient instruction in religion on the one hand, and on the other hand the question of guarding the rights of private conscience and the separation of Church and State. There is a general feeling on the part of American citizens that the rights of private conscience must be respected, the cause of religion sacredly guarded, and the Church and State kept separate. Are all these things compatible one with another?

It seems to be an historic tendency, in our time, to separate Church and State. We speak of it as a principle of our government; it is found in our national constitution. Other nations seem to be moving towards this as a goal, and most of them have arrived at the stage of universal toleration of dissenting faiths, altho retaining an established Church. But it may be held that this toleration, which amounts to indifference, almost, is only an incidental stage in the growth of civilization, and that it is not a permanent settlement of the matter. It may be possible that it is necessary only while the Church is divided by schism, and that it will disappear when the higher degrees of enlightenment arrive and men come to see alike on religious questions. At all events it is well to glance at the grounds on which is based a claim that the Church and the State are each more efficient when completely separate in their functions, that religion without an established Church is more spiritual, more devoted to the highest interests of the soul, and that the State which does not permit itself to interfere in religious matters administers justice in a more efficient

[1] A Paper read before the National Council of Education, at Boston, Mass., July 7, 1903.

manner, and that the school supported by the State teaches the secular branches of instruction with greater success.

The State is the highest of secular institutions, and its function is to secure justice in such a manner that the citizen reaps the fruits of his deeds. Any attack that he makes upon the welfare of his fellow-men should be returned upon him by the State, and, on the other hand, he should reap the fruits of his righteous deeds. The deed that injures society is a crime, and the State sees to it that crimes are punished. As nearly as possible the State returns upon the criminal the symbolical equivalent of his deed. If he takes life he shall forfeit his own life; if he takes property by violence or stealth he shall be deprived of his liberty. Whatever attacks the bond that unites men into society shall be requited by deprivation of life or liberty, or loss of property by fines.

On the other hand, religion does not consider the external act so much as the inward state of the soul, the heart. While the State calls the overt act which attacks the bond of society a crime the Church looks behind the overt act to the disposition of the soul, and defines what is opposed to an ideal state of holiness as sin. Sin and crime must not be confounded, the crime being an overt act may be measured and a just penalty awarded. An equivalent of the evil deed may be returned upon the doer, but sin, which may exist all the same without an overt act, cannot be measured. Only on sincere repentance and utter renunciation of the sin and its consequences will the sinner be forgiven. Repentance does not and ought not to save one from punishment for crime, and, on the other hand, a finite punishment, a penance in other words, does not and ought not to suffice to wash away a sin, and make the soul clean again. We see that the categories of sin and crime indicate a very important difference in the attitude of the soul towards them. It is true that most crimes are to be regarded also as sins, but the State cannot take a deed into consideration for punishment except in so far as it is a crime. In the case of sin in the heart without overt act the department of justice cannot inflict punishment for it. It would be improper for a court to punish a disposition which had not yet become a volition.

We may see this more clearly if we consider what would happen if the Church administered the affairs of the State. If it held firmly its standard of religion, and looked to the disposition of the heart, it would forgive overt acts in all cases where repentance is supposed to be sincere, and, on the other hand, it would punish malignant intention, even when there was no attempt on the part of the will to make it an overt act. This would destroy justice and undermine the State. No citizen would know what to expect, there would be no sure protection of person and property.

If, on the other hand, the Church adopted the standard of justice, borrowing it from the State, it would destroy religion. For if the Church were to look only to the overt act it would neglect the disposition of the heart, and give to its penances a meaning entirely unorthodox. It would make its penance condone for sin, just as the penalty of the law condones for crime. Corruption would come into the Church, and its members would be led to believe that they could make up for sin by good acts; they would lose the sense of the infinitude of sin, thinking that it is only a temporary affair which may be made up by future good conduct. If the State undertook to regulate religious matters the same confusion would occur, and the interests of justice, as well as those of religion, would suffer.

Applying this distinction, on which the separation of the Church and State is based, to education in the school, we shall see that a somewhat similar confusion will arise in respect to secular knowledge, as contrasted with sacred doctrine. The principle of religious instruction is authority; that of secular instruction is demonstration and verification. It is obvious that these two principles should not be brought into the same school, but separated as widely as possible. Religious truth is revealed in allegoric and symbolic form, and is to be apprehended not merely by the intellect, but also by the imagination and the heart. The analytic understanding is necessarily hostile and skeptical in its attitude towards religious truth. The pupil is taught in mathematics to love demonstration and logical proof, and he is taught in history to verify its sources, and to

submit all tradition to probabilities of common experience. The facts of common experience dealing with the ordinary operations of causality are not sufficient to serve for symbols of what is spiritual. They are opaque facts and do not serve for symbols—symbols are facts which serve as lenses with which to see divine things. On themes so elevated as religious faith deals with, the habit of thinking cultivated in secular instruction is out of place. Even the attitude of mind cultivated in secular instruction is unfitted for the approach to religious truth. Religious instruction should be surrounded with solemnity. It should be approached with ceremonial preparation, so as to lift up the mind to the dignity of the lesson received. Christianity is indeed the religion of the revealed God, but there is no revelation possible to the mind immersed in trivialities and self-conceit. In religious lessons wherein the divine is taught as revealed to the human race, it is right that the raw, immature intellect of youth shall not be called upon to exercise a critical judgment, for the youth at his best cannot grasp the rationality of the dogmas which contain the deepest insights of the religious consciousness of the race.

But the advocate of the parochial school often urges by way of rejoinder his view that the secular branches ought to be taught in the same manner as the catechism, which teaches the dogmas of the Church by authority, and it is a fact that in parochial schools the influence of the dogmatic tone sometimes creeps into the secular recitations, and too much authority in secular studies prevents the pupil from getting at the vital points. He cultivates memory at the expense of thought and insight, for the best teaching of the secular branches requires the utmost exercise of alertness and critical acuteness of the intellect. The spirit of authority loves dogmatic assertion, and the memorizing of the exact words of the text-book. It represses the investigating spirit and stifles independent thinking. Arithmetic, algebra, and geometry cannot be learned by authority. Geography and history can be learned properly only by the mind that carefully observes facts and verifies the statements of others. Grammar requires severe application of definitions and logical distinctions.

The Church has thru long ages learned the proper method of religious instruction. It elevates sense-perception thru solemn music addressed to the ear, and works of art which represent to the eye the divine self-sacrifice for the salvation of man. It clothes its doctrine in the language of the Bible, a book sacredly kept apart from other literature, and held in such exceptional reverence that it is taken entirely out of the natural order of experience. The symbolic language of the Psalms, the Prophets, and the Gospels, has come to possess a maximum power of suggestiveness, a mighty influence to induce what is called the religious frame of mind. The highest wisdom of the race is expounded before the people of the congregation in such language and such significant acts of worship as to touch the hearts of young and old with like effect.

In view of these differences between religious instruction and secular instruction, and in view of the contrast between the spirit of the school and the spirit of the Church, it is clear that the school cannot successfully undertake religious instruction, in fact experience goes to show that the school fails to achieve success when intrusted with religious instruction, and it is certain that the Church becomes less efficient when it abates in any way the impressiveness of its ceremonial in its art and music, and in its use of the language of the Bible in its ritual.

The boarding school, whether of elementary character or of college grade, assumes, in addition to the school, the relation of the family to the pupil. The principle of the family is authority, like the principle of the Church, and the boarding school can, and, in fact, must assume the care of the religious interests of the child, and the religion taught cannot be of the kind known as unsectarian religion; it must be the religion of a particular denomination. Unsectarian religious instruction is recommended for the schools supported by public taxes, but such unsectarian religion is of a character far from satisfactory, and it is impossible to have any such unsectarian religion that is not regarded as sectarian by the more earnest religious denominations. The reading of the Bible, the offering of prayers,

the teaching of some simple catechism, are devices borrowed from some particular forms of Protestantism—namely, from those forms which do not use the ceremonial of the Church in the most impressive manner to create a spiritual sense in the pupils who are receiving religious instruction.

In the meanwhile, it is claimed by the serious-minded people who see good citizenship as the foundation of what is valuable in civilization, that the separation of pupils in parochial schools, and the division of the community into religious classes, do a positive injury to the State. It is better for the State to have the children of the community mingle in the common school, and the barriers of religious caste should be broken down so that a universal spirit of toleration shall come to exist. Children of all confessions should mingle in the common school, and learn to know and respect and to love one another. This is necessary to moral education. The parochial school runs the risk of creating a feeling of caste that is not truly religious. There lies the possibility of fanaticism and bigotry in the fact of isolation which is necessary in the Church, but it should not be carried over into the school. There is danger of making the child think that he and his family belong to the sheep while his neighbor, who attends a different parochial school or some public school, is one of the goats. If he comes to believe that God hates his neighbor he will next conclude that it is wrong for him to love that neighbor. Toleration thus becomes a sin. And yet the good citizen will nearly always quote approvingly the words of President Eliot, in which he claims that toleration is the most precious fruit of human development in the past three hundred years.

It is this danger which has been seen very clearly by those who wish to retain in the school only an "unsectarian" instruction in religion. There are certain essential things in religion, such as the being of God, His revelation of His will in the Bible, which they think all people in modern civilization should desire to have made a part of school instruction. The difficulty with this view, however, as I have already indicated, lies in the fact that it amounts only to the setting up of a new religious sect, and adding one more to the many denominations

of religious belief. It is impossible to make a generalization of Christianity without depriving it of something that is necessary to the form of religion, namely, an appeal to the senses and the imagination. For it is essential to the nature of religion that it shall not only be an abstract theological theory addressed to the highest intellect of man, but that it shall also present those highest truths clothed in symbols addressed partly to the imagination, partly to the understanding, and wholly to the religious sense. Quoting from Tennyson one would say:

> "And truth embodied in a tale
> Shall enter in at lowly doors."

A religion is not religion if it cannot arouse the spiritual sense in children and uneducated people, as well as in learned and deep-thinking people. Herein lies the occasion for denominational differences among Christians, which arise oftener in the method of appeal to the spiritual sense than in the ultimate theologic dogmas.

I know that it will be said, and truly said, that Christianity of all religions requires a subtle theology demanding the highest philosophical insight, as well as these other vehicles carrying the truth to the senses and the imagination in the form of a solemn ceremonial. For Christianity is alone among world religions in holding that God is not a hidden God, but a revealed God whose will is known. The theoretical part of Christian theology constitutes the most striking difference between the religion of the highest civilization and the nature-religions which are found in various degrees of development among the lower civilizations. A general statement of its view of the world in the language of philosophy, rather than the language of theology, will show us the impossibility of attempting an unsectarian instruction in religion in the schools supported by public taxes. Religious instruction based on Christianity teaches first the nature of the true God as opposed to the gods of the heathen. The true God creates the world of nature not for its own sake, but for the sake of the human creatures which are to exist in and thru it. Nature is the

method of creating and educating human souls. They are to subordinate nature to their uses. These souls are placed over all lower forms of existence. It is their privilege and duty to recognize God as personal and as divine-human-personal, having will and intellect. God loves men and has sent his Divine Son to die for humanity lost in sin and worldliness, in order that men may be saved, altho not without their co-operation.

This doctrine of the divine-human nature of the true God contains in it, as a germ, all of Christian civilization. All of the good things, which form the power and the glory of civilization, flow as a result from this doctrine; viz.: science, the useful arts by which nature is conquered for the service of man; literature, history, and philosophy—all these have a particular endowment derived from the religious doctrine of Christianity, and you cannot successfully teach them to a people that is bound to a heathen creed.

A mere nature-religion does not admit of science, free thought, and the control of matter and force by machinery, for these are the elements that the heathen mind worships, or dreads with a mortal fear as evil demons, and the savage man spends his whole life in trying to propitiate them with ceremonies and sacrifices. Christianity was the first of all religions which taught that God transcends nature—that He created it by the Divine Word—and that he did all this for the sake of man. All time and space is therefore the cradle of man, and the processes of nature exist for the purpose of nurture—the nurture of individuality—individuality as a basis of personality; first the crystal, next the plant, next the animal, finally man. God is absolute Personal Reason, desiring to share his independence of thought and will with other beings whom he creates thru nature and raises above nature, to be immortal persons, and to live in his Kingdom forever; not as mere beholders of the spectacle of infinite Grace that gives life and freedom to creatures, but to be active workers in that Kingdom, participators in the missionary activity that continually works in the universe to make over the evil into good, and the good into the better.

According to this doctrine God is love and grace, and the nearest approach to the divine life that man can make is to be filled with the missionary spirit—the spirit that strives with all its might to aid others to see the light, and persuade them to become active in helping their fellows.

This theological doctrine is the beginning of religion in its truest and highest sense, as Christ taught it, and as all denominations of Christians agree in professing it, however much they disagree in the manner of celebrating it by ecclesiastical ceremonies—*i. e.,* forms of worship—and however much they differ as to claims of authority, or as to application of this doctrine to human life existing on the earth or in other worlds in space.

In nature-religions, religions that conceive the divine to be some form of being in time and space, superstition has had and must have so large a sway in the human soul as to make impossible the free development of science, and the invention of arts which are needed to conquer nature. Only with the advent of a doctrine that nature is not a god nor a demon, nor a collection of demons, but only a vast process of creating and nurturing individuality—only with the arrival of this view of nature, this theory of the world as a theological doctrine, science and free thought become possible.

With the doctrine of the transcendence of the human soul, its separation from nature, even while in the body, and in its immortal individual and social life beyond the grave, man attains a free attitude towards nature, and may explore it not only without fear, but with a confidence that it ought to be made of service to man in every one of its processes. Human invention may freely discover combinations thru which the elemental forces—wind, water, fire, electricity, and gravitation, may be harnessed for the use of man—nay, even for his comfort and for his amusement;—that is to say for his bodily wants of food, clothing, shelter, and recreation—for his bodily wants, as well as for his spiritual wants such as intercommunication of all men with all men, sharing in all experience of life; sharing in all discoveries in science, in the use of all discoveries and inventions—sharing in all insights into the

divine conduct of the world, or into the ultimate ends of nature and man, participating in all the great deeds that tend to benefit the race.

Superstition sets up on all hands some opposing powers in nature of a demoniac sort that are jealous of man's dominion, and revengeful against his intrusion into their realms by scientific investigations or by mechanical inventions.

It took long centuries to arrive, under Christianity, at the stage of conviction and insight which dispossessed nature of its demons, and reached the doctrine of a divine Reason acting thru beneficent laws. The earlier view was that of a divine power which could manifest its transcendence over nature only by occasional arbitrary interventions that set aside those beneficent laws. The opposition to science on the part of the superstition which is inseparable from nature-religions, took a new form in the Hebrew religion, the religion of the Old Testament. The great doctrine of God's transcendence on which depend man's freedom and immortality was revealed first in the form of miraculous interference with the course of nature. God, in the Old Testament, was seen not so much as a Providence creating and nurturing individuality into freedom and responsibility thru nature, as a God manifesting his independence of the world and of its laws by interference for occasional reasons with the order of nature. Hence, too, death, and its causes thru pestilence, famine, floods, storms, conflagrations, accidents by sea and land, have been dwelt upon in the past by religious teachers with more emphasis as revelations of divine power than the far deeper revelation of the divine in nature as creative and nurturing power. The Son of God as the divine archetype of the missionary spirit in the Church has been preached from the day of Pentecost, but it has not been so fully realized in thought as have those other important dogmas of sin and redemption, and the transcendence over nature, until the advent of modern natural science with its doctrine of evolution. It is all-inclusively stated in the doctrine of the Trinity, which especially names the work of the Logos as that of creation and salvation.

The bare enumeration of Christian doctrines in language

partly secular is sufficient to show the impossibility of their introduction into the curriculum of schools supported by public taxes. The necessity of considering the rights of conscience of all citizens alike in the State schools renders it impossible to bring in religious ceremonial or teach doctrines that are distinctively religious. An undenominational religion does not exist. Even the doctrine of the existence of God implies a specific conception of Him, and the conception of the divine varies from that of the finite deities of animism to the infinite deity of East Indian pantheism and the Holy Bible. It varies from the pantheistic Brahma, whose concept is that of negation of all attributes, to the Jehovah of the Bible, who is self-determined and personal, but elevated entirely above nature. Mere deism is opposed to all of the creeds of Christendom. When we come to teaching a live religion in the schools we see that it must take a denominational form, and, moreover, it must take on the form of authority, and address itself to the religious sense and not to the mere intellect. All the studies of the school, addressed as they are to the intellect, are opposed to the healthful action of the religious sense. We are forced, therefore, to conclude that the proper place for instruction in religion is the Church. Only as propounded from the sacred desk and clothed in the consecrated text of the Bible can the dogmas of Christianity be made to edify the people of the congregation, young and old alike.

Religion has two elements, worship and sacrifice; worship is the action of the intellect and emotion, and sacrifice is the action of the will. The Church provides for both of these things, and for ages it has been at work elaborating its means of instruction. The Church pedagogy is far more difficult than the pedagogy of the schools, because it has been obliged to take most pains with the instruction of the senses and the imagination, while the school has done little in this respect. The Church has been obliged to educate the senses into a habit of interpreting its impressions symbolically. In the act of perceiving the sensuous objects of religion the mind is trained into neglecting the particular concrete meaning of what is before it and preferring in its place a symbolic or allegoric

interpretation, putting a spiritual reality in the place of a material reality. The things of sense are subordinated and the realities of the spiritual world are made to take their place, and one cannot lay too great stress on the part which the archaic style and figurative modes of expression of the Bible have in appealing directly to the spiritual sense.

It is difficult for most people to comprehend how important is the isolation of the Bible from all other books, and the consecration of it as a divine book that has come to us direct from God and not thru the authorship of man, is to the effectiveness of religious instruction. If the higher criticism should destroy entirely the theory of the special inspiration of the Bible and make it like other ancient literature, so long as it was not read much in the way that a secular book is read and studied, the language of the Scriptures would retain its peculiar force as addressed to the spiritual sense—a force which no other literature possesses or is likely to possess, for these Scriptures were written by a people in whom the spiritual sense was more pronounced than in any other people among the nations of mankind. Just as the Roman mind was sharpened to observe and record the ordinances by which the individual will can embarrass or re-enforce the will of the State and thereby was enabled to contribute the priceless gift of Roman law to future civilizations, and just as the Greek mind discovered the æsthetic forms which constitute what may be called the piety of the senses—the discovery of gracefulness as the perfect revelation of the beautiful—in the art of sculpture; and on the other hand, in poetry discovered how to use the forms of all nature as tropes and images of the mind, and in the later or prosaic form of philosophy the Greek mind discovers the scientific point of view—so the Hebrew mind seizes the transcendent cause, self-subsistent, omnipotent, and omniscient as the absolute being—divine-human in the sense that the divine personality, having will and intellect and affections, creates the human being with intelligence and will and affections and with the high privilege of communication with God. In the course of its long centuries of checkered experience the Hebrew mind elaborates and ripens its spiritual theory and

unfolds the doctrine of a Messiahship, which in the fullness of time becomes the Logos doctrine as the theory of a second divine person, and the doctrine of the Holy Spirit as a third divine personality, an institutional personality which presides over the infinite invisible Church.

We may thus get a partial glimpse into the significance of the Bible as an instrument of religious education, but it is in the nature of things that what is symbolic has not merely two meanings, the one literal and the other the symbolic, but there is an infinite series of meanings possible to each symbol and it requires, therefore, the authoritative interpretation of the Church to settle the orthodox meaning. The spiritual sense is other-worldly and when its insights are translated into what is secular it may be made to contravene the moral world order, and this has happened in a myriad cases.

We must conclude, therefore, that the prerogative of religious instruction is in the Church and that it must remain in the Church, and that in the nature of things it cannot be farmed out to the secular school without degenerating into mere deism bereft of a living Providence, or else changing the school into a parochial school and destroying the efficiency of secular instruction.

The Church ceremonial that is the most elaborate will suffer least injury from the disenchantment produced by the higher criticism of the Scriptures and by the mechanical and atheistic interpretation of scientific discoveries. The great hymns of the Church, such as the Dies Iræ, the Stabat Mater, and the entire galaxy of Latin hymns which express all the phases of Christian feeling and thought and will, rendered by fitting music that is religious to the core, furnish a perennial vehicle for religious instruction. One is thankful to remember that religious music of the highest order is in process of composition in our time, altho painting and sculpture have not discovered how to retain religion in the realistic forms of art. Music and poetry yield themselves to religion, and the highest poetry and music have done this for hundreds of years. The true æsthetic is the vestibule and forecourt of religion. One feels sure that the Church must not relax whatever of strict theo-

logical teaching it has in operation, and its theological seminaries must recover from the blighting effect of Kant's Third Antinomy. And I, for one, must think that those denominations which have least ceremonial should consider carefully the use and function of ceremonial such as it is and has existed in reaching the spiritual sense thru its transformation of imagination and sense-perception. Above all the Church management must not rest in security on the belief that the time is coming when it may safely rely on an unsectarian instruction in the elementary schools for the spread of true religion, nor rely upon the re-establishment of parochial schools in place of free schools under government control and supported by public taxes.

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III

EDUCATION AS A UNIVERSITY SUBJECT

Jean Paul Richter quotes the French artist who required from the director of the ballet, besides the art of dancing, only geometry, music, poetry, painting, anatomy. "But," he adds, "to write upon education means to write upon almost everything at once; for it has to care for and watch over the development of an entire world in little,—a microcosm of the macrocosm. If we carried the subject still further, every century, every nation, and even every boy and every girl, would require a distinct system of education, a different primer, and domestic French governess, etc."[1] The subject of education is still more encyclopedic to-day than when Paul Jean Richter wrote these words. Its foundation involves the whole physiology and psychology of development in the individual and the history of culture in the race, and its superstructure includes not only all the various forms and systems and methods of education, but the study of the influence of environment in the widest sense.

The conventional views minimize both the difficulties and the importance of the subject. It is said that education is applied psychology or applied child study, and again, that education must get its norms from the history of education and from child study. This statement will do, if one knows what it involves. The history of education means the history of civilization from its earliest traceable genesis among primitive peoples. It means a study of types of culture and the conditions of their development. In a word, it is a study of the evolution of education. Child study means, too, the study of the physiology and psychology of development in man. The science of development aims to give a complete description of all the stages of physical development from infancy to maturity, to show their sequence and their relation to the acquisition of

[1] Richter, *Levana, or the Doctrine of education*, p. ix.

organic, sensory, motor, and psychic processes. As far as psychology goes, it is genetic psychology—which means more than is frequently connoted by child study. Adult psychology is one thing, relatively fixed, except for variations incident to environment or the individual. Child psychology, even for a single individual and a given environment, varies continually, because the individual is in the process of growth and rapid development of function. It is one thing for the infant, a very different thing for the child who can walk and talk, still another at that plateau in the curve of development that is likely to occur somewhere between nine and twelve for girls and ten and fourteen for boys, still another for the adolescent. The variation is seen in the period of a single year, almost with the changing moons. This is true, not only on account of the grosser acquisitions, but is seen in the sequence of interests and activities. Thus child psychology is protean. It varies not only with the individual and environment, but especially with the stage of development. Further, the science of development includes comparative psychology. Not only must the child mind be compared with the adult mind, but the stages of development in the child should be compared with the stages of development in animals, the faculties of the child with those in animals, the motor ability and activities of the child with those in animals. And again the stages of development in the child should be compared with those in the race,—ontogenesis in relation to phylogenesis must be studied.

All this is scientific study,—not directly practical. Before deriving the norms from practical education, a propædeutic study must be made. As Professor James has said: "Psychology is a science and teaching is an art; and sciences never generate arts directly out of themselves. An intermediary mind must make the application by using its originality." This mediating function is represented by two somewhat vaguely defined branches of education,—educational psychology and the general principles and methods of education.

Again, after the general principles of education have been derived from psychology and history, and the theoretical

norms established, they must be verified by practical educational experiments. This brings us to the practical side of education represented by such subjects as the organization of schools, the art of teaching, and special didactics. And parallel with the art of teaching in its derivation from the science of development is school hygiene, which studies especially the conditions that favor the healthy development of the school child. Thus education is both theoretical and practical, at once a science (at least potentially) and an art.

Such is the subject, which, as the Italian proverb runs, is always poor and naked, and in the words of a German writer has long sat as a drudge at the academic hearth, and whose highest recognition in the great universities has usually been as the handmaid of philosophy. Everybody believes in education, yet few believe in studying it. The reasons for this are obvious. Apart from a few fundamentals that are almost commonplace, education has lacked a solid body of scientific knowledge and universally accepted principles. Worse than this, it has lacked a definite method and a definite ignorance.

Most of the works on the history of education are filled with accounts of second-rate writers and second-rate books that happen to be labeled educational, while the really great educators have often been neglected, and educational movements have been described as isolated currents in the progress of civilization, without regard to their vital connection with political, social, and industrial movements. The method has been the elementary method of studying and describing isolated facts without regard to historical perspective and causal relations; and even the works of the classic writers have been chiefly the repetition and recasting of a few old truths which had been forgotten or were ignored at the time in which the reformers lived. For example, Comenius two hundred and fifty years ago taught that we must study nature by the inductive method and adapt education to the sequence of the stages of natural development; but his writings were forgotten, and again and again the reformers have had to teach again to a new generation the simplest principles of the Comenian didactic.

Most of the books on the educational systems of to-day in like manner consist of the barren details of organization and method and the description often of inferior teachers and schools. The forces that have produced these teachers and schools, the significance of the educational movements, have not been seen; and the philosophical, social, and religious thought that has determined educational ideals has not been studied. These isolated facts are barren. Their real significance is in their relation to other facts. We cannot, for example, understand the educational events in England to-day unless we know something of the wider relations of the school movement. The new Education Act was a political quite as much as an educational measure. It was forced through Parliament under the leadership of the Prime Minister; and its passage has moved half of England so that certain Non-Conformists are ready to offer their household goods to the sheriff rather than pay what they deem an unjust tax for the support of sectarian schools. This struggle is probably an episode of a great movement for the disestablishment of the Church of England. The commissioning of a new Fellow for university extension work marks another step in the progress of the democratic ideal, which, no longer satisfied with provision for elementary education for every child, now demands also for each individual, according to his ability, a share in higher education. A new endowment for a technical school by the Worshipful Society of Goldsmiths, or the like, may perhaps indicate a new dread of Socialism on the part of certain monopolists quite as much as any special interest in industrial education. Oxford itself, with all its marvelous beauty and idealism, the stronghold of conservatism, cannot keep aloof from the great social, industrial, and educational movements outside. No better illustration could be chosen to show the progress of the democratic ideal of education. At the beginning of Queen Victoria's reign, one could not even study at Oxford without subscribing to the Thirty-nine Articles. A few years ago, Jowett advocated opening the University honors and emoluments to the world, admitting anybody to any University examination, without restriction of sect, class,

race, age, or residence. As was remarked at the time, if fifty or perhaps twenty-five years ago, a radical undergraduate were to have made such suggestions, he would have stood a chance of being expelled from the University, as Shelley was for blasphemy; now, they are the last words of Jowett, quoted with approval before the Vice-Chancellor.

To miss these larger aspects is to miss everything of permanent value. Historical literature in education has relatively little importance for its direct practical teachings; but the importance of the history of education as a culture subject can hardly be put too high. Education represents one of the deepest human interests, more vital than politics and well-nigh as universal as religion. The history of education is the history of the development of civilization. It aims at nothing less than the study of the school as a factor in the development of culture in relation to the other factors in education,—the home, the Church, the farm, the work-shop, the playground, and the rest. And it aims at the study of educational movements in their genesis and in relation to political, social, industrial, scientific, and literary movements. This involves not merely the study of educational writers, so-called, and school systems, but the study of types of culture and the causes that condition them.

Likewise in other parts of the field the failure to recognize the wider significance of the subjects studied and the attempt to build systems before the foundations were laid have brought pedagogy into disrepute. But in recent years the conviction has grown that educational problems must be studied inductively; and better still, important contributions by the inductive method have actually been made. This has put life into the subject and given hope for the future. Take child study as an illustration. The significance of the modern study of children is not merely the renewed emphasis on the old truth of adapting education to the stages of development, but the insight that the only way to make this principle vital is concrete inductive study to find out just what are the stages of natural development. Thus, every fact in regard to general development or individual variation is deemed significant, and

the student is willing to wait for a new science of development before attempting a permanent pedagogical system.

During the past ten years the opportunities for truly scientific work in education have been shown as never before, methods have been demonstrated, and in part the foundations of a science have been laid. The things now needed are trained men and facilities. With them a solid content of scientific knowledge can be acquired that will place historical and social education on as firm a basis as general history and sociology, and genetic education on a scientific footing comparable to that of psychology. School hygiene has already its methods and a solid body of knowledge, but it needs special laboratories for instruction and research either independent or in connection with those of psychology, physiology, and anthropology.

The work in education in a university, altho the practical aspects of the subjects studied need not be neglected, will be chiefly in the more scientific and theoretical parts of the field. It is not less important on this account. The study of education, like research in any other field of history or science, is valuable for its own sake, without regard primarily to practical results. It is its own justification and its own reward. With the nucleus of solid scientific contributions that now exists, no university can long afford to omit courses in education from its curriculum, whether they have any practical value or not. Such scientific studies, however, cannot be divorced from the practical art of education. The studies of children have emphasized the doctrine that the aim of childhood is its own perfection, and the best guarantee of normal maturity is normal childhood and immaturity; in a word, they have emphasized the principles of normal development. But these principles are no longer educational abstractions; they are greatly modifying the practical work of education, causing greater regard for individual children rather than for uniform classes, for health rather than scholastic products, for a psychological order of instruction adapted to the capacity and interests of children rather than logical sequence and articulation of grades. In a word, they are causing courses of study and methods to be reconstructed with regard to the one funda-

mental principle of fostering normal growth and development. To mention a few details, ten years ago school baths, adjustable seats and desks, and vertical or other hygienic script, were vagaries of university theorists, to-day they are deemed essentials in every new school. Ten years ago, suggestions of periodic disinfection of school apparatus and school text-books, of investigating pupils' individual capacity and power to resist fatigue, and of adapting education to individual capacity and interest in elementary and secondary schools, were liable to be ridiculed, now their soundness has been demonstrated by practical experiments.

There has been much discussion of the question whether or not there is a science of education. The answer depends, of course, upon how one defines the word science, and where the line is drawn between education and related subjects, especially physiology, psychology, history, and sociology. It is not helpful to juggle or conjure with the word science, but it is worth while to notice that a large part of the subjects that concern education may be studied by the scientific method. In the first number of the EDUCATIONAL REVIEW, Professor Royce, basing his discussion upon a paper by Professor Dilthey, showed the vanity of supposing that there is a universally valid science of education; and yet, on the other hand, numerous vitally important contributions to the subject of education during the last ten years have shown the value of applying the scientific method in this field.

It may be objected that the account of the field of education here given ignores the traditional classification of the sciences. This is largely true, yet the relation of the different fields of scientific investigation is not represented by adjacent circles lying outside each other, but rather by circles that overlap; in other words, much of the field of human knowledge is common to several departments of scientific investigation. A recognition of this simple fact, that the fields of adjacent sciences overlap and are interrelated, would save much futile discussion. In any case, there is nothing sacred about the conventional boundaries of the different sciences; and in the vast undeveloped country of scientific research no " sooner's " claim

is valid against any new-comer with a new point of view and a new method.

Especially close is the relation between psychology and education. Such vital connection is natural, and has mutual advantages. Education is based on psychology, and owes to it the inspiration and stimulus of scientific work, and psychology owes to education the suggestion of some of its most fruitful fields of investigation. Whether the study of the development of the interests and faculties in a child's mind is called psychological or educational investigation does not matter, but the importance of such study for education it is unnecessary to emphasize. Again, one might call Dr. Paulsen's investigation of the functional development of children's voices a study in school hygiene, or in physiology, or in experimental phonetics, but in any case it is an important contribution to education.

The close connection between the history of education and general history has already been suggested. The former is a part of the latter, and should be studied by much the same methods. With the modern conception of history, by which it is not limited to the study of politics, but is concerned with the whole development of civilization, *Kultur-geschichte*, the history of education becomes a very important part of it; and as education represents the great factor in the development of culture, its history gives opportunity for profitable research.

It is desirable, first of all, that contributions of truly scientific value should be made—studies of special chapters and phases of educational history, like Woodward's *Vittorino da Feltre and other Humanist educators;* Paulsen's *Geschichte des gelehrten Unterrichts im Deutschland seit den vierzehnten Jahrhundert;* Rethwisch's *Deutschlands höheres Schulwesen im neunzehnten Jahrhundert;* the study of important educational movements, like Craik's *The State in its relation to education;* studies of growth and development like those of Hancock, Burk, Bryan; of individual development like those of Preyer and Miss Shinn; studies in the psychology of learning different subjects, like those of Bryan, Lay, and Thorndike; and special monographs upon many other topics. Such con-

tributions are specially needed to raise education to its proper place as a subject of academic study. The opportunity for research is so great that the subject deserves to rank with other departments of science and culture as suitable for university investigation.

The university department of education should also furnish material for culture courses in education suitable for the college curriculum. The only valid excuse for neglecting a universal human interest like education in the college has been that until recently there has been no adequate material to form the content for such a course. Contributions have already been made, however, of sufficient value to make one or two courses of this kind possible, and others are likely to follow in the near future.

For a single concrete illustration, a competent man with an insight into the wider social and political relations of education, with the ability to see the special educational influences in a country in right perspective, could give a culture course in ancient Greek education of first-rate value. The mere mention of some of the books that would naturally form the nucleus of such a course is sufficient to show that there is material already at hand for it. Among the books would naturally be: Grasberger's *Erziehung und Unterricht im klassischen Alterthum;* Girard's *L'éducation Athénienne;* Jowett's Translation of the *Republic* of Plato; Nettleship's *Theory of education in the Republic of Plato;* Monroe's *Source Book in the history of education* for the Greek and Roman Period; and Davidson's *Aristotle.* Of course, the ancient Greek nation offers an unusual opportunity for the study of education as a factor in the development of a cultured people, because, as the older philologists like F. A. Wolf pointed out, the culture of the ancient Greek nation was in a large degree complete, and it is possible, in its literature, institutions, monuments, and works of art, to study the various factors that contributed to the production of the Greek character as a cultivated nation. In a word, the data are all in.

To make a university department of education what it should be, the whole field of education should be covered by

lectures as far as possible, and research should be extended to the multitude of subjects that offer opportunity for study. There should be laboratories for school anthropometry and school hygiene, an educational museum and a pedagogical library, like those of the *Musée pédagogique* in Paris, and model schools for the objectification of ideals under the direction of competent teachers, who should safeguard the interests of the pupils instructed, but offer to university students opportunities for observation, and in some cases for practice in school work.

For such a department, of course, a large number of lecturers and instructors is needed; as long as one man tries to cover the vast field outlined above, the university in the future, as in the past, is likely to look somewhat askance at the chair of education as representing either a worn-out philosophy or a science lacking sufficient body to justify its academic existence, or, on the other hand, if it tries to be practical.

In conclusion, then, the aim of a university department in education is naturally twofold: first, to contribute something to the body of knowledge in regard to education, the content of education; second, to give professional training to students preparing to become teachers of the subject in colleges, normal schools, or the like. These two aims are not in conflict, for an essential in the training of a teacher of education is the development of those permanent professional interests and the professional apperception and prevision acquired from the study of the subject by scientific methods. The thing specially needed to place the subject in its proper position among university studies is a substantial addition to the nucleus of scientific contributions already made in the field; and some of these would naturally furnish material for the development of culture courses in education suitable for the college curriculum.

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IV

EXERCISES IN THINKING ABOUT NUMBER AND SPACE: TRANSITION TO ALGEBRA AND GEOMETRY (1)

To solve this problem of transition is to answer two questions: when? and how? No one can prove that his answer to either question is the best possible answer. Both questions belong to the domain of probability.

As to the first question, I do not hesitate to agree with those who find that theory and experience combine to recommend the introduction of algebra and geometry into the course as early as the seventh school year. This is the period when the rational powers of the pupil come swiftly forward to claim their own, while, by common consent the subjects in question, when properly served, constitute an almost ideal diet at the puberty stage of intellectual development. In view of the unmistakable character of this *a priori* indication, it is not surprising that it should be so generally verified by the experience of those who have tried it. Indeed, such lack as there may be of entire unanimity is to be accounted for, I venture to believe, rather on a variety of other grounds, such as the unfavorable conditions under which the plan may have been tried, or the occasional incompetence of one charged with the experiment, than on the supposition of any inherent infeasibility of the plan itself. But be this as it may, our present primary concern is not with the question of a proper time for making the transition, important as that question undoubtedly is. It is the second of the foregoing questions with which I purpose to deal, the question of method of transition, and it will be sufficiently clear, I hope, that the following series of suggestions respecting the latter question do not essentially depend for their value or their practicability upon any opinions that are likely to be held regarding the former.

During the first six or seven years of his school life the pupil has been as one dependent on authority, far more largely and inevitably so dependent, I think, than is commonly supposed, even allowing that he has enjoyed the benefits of the most expert and enlightened teaching. In order to prepare him for the exigencies of a complex and conventional civilization, for the need of which he has no adequate sense, a correspondingly complex and conventional machinery has been employed to carry his education far beyond the range of his dominant instincts. And so he has been learning to perform processes whose logical significance, candor compels us to say, if words are to retain their meanings, far transcends alike his desire and his ability fully to appreciate. His mind has been less illuminated by soundly reasoned explanation than impressed and formed by what he feels to be authoritative example and dictation, direction and recommendation. Accordingly, altho during this time he has gained considerable skill in operating with integers, fractions, and simple surds, it is impossible that he should be in possession of a logically constructed theory of number. He has learned to use certain kinds of numbers by actually using them, and he has been using them rather than thinking about them. They have been instruments or tools in his hands rather than subjects of his thought. He has been rather a practician than a theorist. But now he has arrived at a critical stage in his life when profound and rapid physiological changes are to be paralleled by psychical transformations no less rapid and profound. External authority shall become known to him as such and shall dominate him less and less. There shall arise for him a new standard, an internal authority, that of his own reason, challenging the master's dictation and formula, judging for itself. He is to become not a less, but a less *blind* practitioner, assuming the scientific attitude, demanding the light of rational theory and sharing more and more in its criticism and construction. He is prepared now to regard the number system, not merely as a collection of tools ready to hand, but as an object of rational interest, and to appreciate something of its deeper human significance, to feel something of the motives which have led to its creation or

generalization, to behold it as a living thing, and to enjoy its growth under his own attendance and cultivation.

Immediately the question confronts us: How make his further mathematical education contribute to these ends? How effect the transition to algebra?

The worst way to begin is to fasten about the learner's neck the dull weight of the average text-book. His entire nature cries out for action, for the fresh and the vivid. If this inherent craving is vicious, if spontaneity is to be repressed, prescribe a course of lessons in a book opening with abstract definitions, followed by deductions devoid of spirit, and by pulseless proofs or pseudo-proofs of propositions that may or may not admit of demonstration. Considering that the patient, being young, will readily respond to treatment, the cure in most cases will be certain and speedy, and the medication need not be prolonged. Not that definition, deduction, and demonstation are bad. By no means. These three *d's* are not only good, they are indispensable, but it is as things not done but to be done, to be produced by the pupil's own spiritual activity, that they are good and indispensable. The distinction is fundamental. Lying in the average text, they are as deposits, evidences and remains of *former* thought, shapes and forms wrought and left by currents of life that *have* been. Interesting to the mature mind as monuments of past achievement, and invaluable as guides to the teacher, such forms, labeled and shelved on the printed page, put static and cold before youth longing for activity and life, serve mainly to depress and repel. Now, on the other hand, the subject itself, the matter of it, is not alien or far away. All science springs from a soil of common notions—a fact equally true of every branch, most obviously true of mathematics. Everyone must count and measure or perish. Mathematics is common sense, refined no doubt, purified of its dross, sublimated, etherealized, but essentially and radically common sense, and the *spirit* of mathematics, which is the spirit of right thinking, stirs in the common heart. How, then, account for the proverbial balking at algebra and geometry, a disaffection often amounting to positive hatred or disgust? To answer, one has only to reflect how

these subjects are commonly begun, by means of definition, deduction, and demonstration, and that at first these things tend rather to deaden than to quicken, that they do not give life, but are given by it.

It is, then, this productive *life* that is to be secured, a life doubly justified, first from within by its own joyousness, and again from without by its results. And what is this life? It is the activity of thought, the play of spirit, dealing, not primarily with the *d's*, but immediately with the stuff to which the *d's* relate. To secure this life and to guide its activity, I know of one way, but not a second. That way is the way of dialectics in the Platonic sense of the term. I therefore propose and recommend that, before entering formally upon the study of algebra by means of text-books, a series of lessons be given in the nature of exercises in thinking about number, the affair to be conducted mainly, or very largely at any rate, by means of dialogue or informal talk between the teacher on the one hand and the pupils on the other. And I make a similar recommendation in regard to geometry, for that which has been said above concerning number and algebra is equally valid, *mutatis mutandis,* in respect to space and geometry. I can think of no greater or more grievous error than that of supposing the study of geometry to be identical with the reading and reproduction, or even the production, of geometric demonstrations. Most errors of thought are due, not to bad logic, but to false ideas. It is the cultivation not merely of the reasoning power, but mainly of conception, the generation of geometric notions, the development of the space intuition or imagination, above all the evolution of scientific curiosity, which grows by what it feeds upon, that the teaching of geometry should aim at, especially in the beginning.

In order to render the recommendations quite intelligible, and as available as may be, it is the intention to indicate at a later stage what I conceive the scope of the proposed exercises should be, and to prepare with considerable detail a number of them for serial publication in this REVIEW. It is, no doubt, superfluous to say that the suggested dialogue exercises to be here presented are tendered merely as suggestions, and are in no case

to be regarded as final models to be used or copied *verbatim et literatim*. Above all, it should be understood that, however excellent the content, and however perfect the *order* of its presentation, and these are matters of great importance, the value of the dialogue, its effectiveness, will depend upon its spirit, upon the energy, freshness, spontaneity, enthusiasm, verve, with which it is conducted.

I hope to show, too, how the two varieties of exercises can be mingled for their mutual enhancement, and so that neither the one subject nor the other shall seem to be an insulated compartment, but that, on the contrary, the pupil may unconsciously gain an abiding sense of the wondrous interpenetration of the number and the space domains.

I

Concerning Number

(Positive) Integers, or Count-Numbers

On the Fundamental Law of Number: The Number of Objects in a Group of Things Is Independent of the Order of Counting Them.

How find how many letters in the word *horse?* What words did you use in counting? Which one last? How many letters in *horse?* Does the last word used always tell the number of things counted? Are you sure? Well, try again with another word. Write down the words you count with. Have you written all of them? Where do these words come from? Do they grow like trees, or do we make them? Can we go on making new count-words as long as we please? Which of the words did you use in counting the letters of horse? Which is the *first* count-word? the second? Do you always use "one" first, "two" next, then "three," and so on? Which of the words in the row of count-words are most used, those in the left-hand part of the row, or those that are farther to the right?—I noticed that you said "h one," "o two," and at last "e five." Could you begin with *e* and go the other way? If you did so, would you find the same number? If you were

not sure, how could you find out? Are there still other *ways* or ORDERS of arranging the letters in a row? In how many ways can you arrange and count the letters in *at? cat? Kate?* Write them out thus: a, t; t, a; c, a, t; a, t, c, and so on. You find for *at*, $2 = 1 \times 2$, ways; for *cat*, $6 = 1 \times 2 \times 3$, ways; for *Kate*, $24 = 1 \times 2 \times 3 \times 4$ ways. Can you not now *guess* how many ways you could arrange in a row the letters of *horse?* [The number is $120 = 1 \times 2 \times 3 \times 4 \times 5$.] Would you like to write them out? And, now, I believe you can tell me the number of ways of arranging and counting the letters in the word *computability*. How many letters are there in this word? Have you counted them in *every order?* Can you be *certain* of the number by counting in *only one* way? Is one way as good as another? Could you count all the trees in yonder forest? All the grains of sand on the Atlantic shore? Try to imagine all these grains arranged in a row, and then in all the ways they *could* be arranged in a row. Which would be larger, the number of grains or the number of rows? Suppose each grain broken into two grains, and each of these two into two others, and so on. Could you in this way make more grains out of a single one than you had in all at first? Can you name a number *larger* than *every* other number? Is it correct to say that there is a largest number, a *number larger than all others?* Is there a *smallest* whole number? What is it? But no *largest?*

The Distinction of Finite and Infinite

Can you think of a group of things containing so many that you could not count them? Even if you should keep on counting? The numbers themselves are things, are they not? Write them down in a series beginning with 1. Can you write all of them? Can you count all of them, those you have written, and those you have not written? Could you ever arrive at the last number? Try the points on this line. Can you count all of them? It is clear, then, that there are two kinds of groups, a kind that we can count if we keep on long enough, and what other kind? We will call the first kind *finite* groups, and the second kind *infinite* groups. Now, tell me what a finite

group is. An infinite group. Point out one of each kind. Can you think of another infinite group? (Points in a surface or solid; instants, or time points in a stretch of time.)

Concerning Space

On the Generation of Elementary Concepts

A. *By Help of the Idea of Motion.* Look at this ball. Is it perfectly round? If it is not, can you imagine that it is? Let us so imagine it. Do you know any other name for the ball? Does the sphere take up room? Is there any room which it does not take up? Where? What do we call such rooms? (Parts of Space.) What bounds or separates the room the ball takes up from the other room? What shall we call this boundary of the sphere? (The surface of the sphere.) If anything were in the sphere could it get out without going through the surface? How far is it from the surface to the inside of the sphere? To the outside? Has the surface any thickness? (No.) Can you think of a place just as far from one part of the surface as from every other part? Is there any other such place? What is the name of this special place? (The center of the sphere.) Can you think of the sphere growing smaller and smaller, shrinking up towards the center? Can it shrink so as to be a sphere while it is shrinking? Now let it shrink up until there is no distance between the center and the surface, how large will the sphere then be? How large is the center? Is the center in a single place, and not some other? Can I say it is here and not there? Has it any size? Has it position? What shall we call the center? (Point.) What, then, is a point? (It is that which has position but no size.) How long is a point? How wide? How thick? Does it take up room? (No.) And yet it is *in* room, in space? How much room would a dozen points take up? A million? Could you, by taking one point after another and putting them side by side, make a line? Why not? Can the ball be moved to another part of the room? Then the center can move, too? The center is what? So a point can move? What shall we call its path? (Line.) What, then, may we say a line is? (A line

is the path of a moving point.) Has a line thickness? Width? Length? When the sphere moves, does the room it occupied move, or stay where it was? The ball and the room it takes up are two different things, or the same thing? The two things are alike in one respect. What is it? (Shape.) The ball is one sphere, and the room it takes up is another sphere? Do these two spheres differ in size? How do they differ? Can you think of a sphere where there is no ball of wood or other material? Let us call such a sphere a space sphere or a geometric sphere. Has it color? Weight? Size? Can one such sphere be bigger than another? Think of such a space sphere and think of a point. The point must be inside the sphere, or, where else may it be? (Outside or on the surface.) If the point is on the surface and moves, can it move on the surface? What do we call its path? Where, then, is this line? Suppose the point to leave the surface, how far must it move to get off the surface? Which of the inside points is furthest from the surface? Is there an outside point further from the surface than every other outside point? Can you think of the sphere moving without changing its center? How? Show me. What shall we call such motion? (Rotation about the center.) Imagine a straight line running thru the center like a knitting needle. Can you think of the sphere turning about this line? Does such turning change the line? Does it change the position of any point in the line? Does any other point of the sphere remain unchanged? Turn the sphere about one center line a while and then about another. Is there a point that remains unchanged during both turnings? How many such points? What point is it? Think of three points inside the sphere, but not in a straight line; can you move the sphere so as to leave all three points unchanged? So as to leave two unchanged? How? Any two? If more than two are to remain unchanged, how must they lie, and how must the sphere move? Now, take a point and let it move? What do we call its path? Let the path or the line move. What is its path? (Surface.)

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(*To be continued.*)

V

THE COMBINED COURSE FOR THE COLLEGIATE AND PROFESSIONAL DEGREES [1]

The question on which I am to speak is so intimately connected with those which have already been discussed, and it is so difficult to make my position on this question intelligible without indicating my views on the others, that I shall ask your patience for a brief preface.

The college has undoubtedly a field peculiar to itself, viz.: that of educating men who are not satisfied with the view of history and life which may be obtained in the high school, who have or can procure the means for further study, but who do not propose to enter any of the recognized professions. With many college graduates all systematic education stops at the moment when they receive the first or college degree. The college also prepares young men not only for the recognized professions, but for non-professional graduate work; and this work, the amount of which is rapidly increasing, is already correlated, in a way that is, on the whole, satisfactory, with the four-year course for the college degree. As regards both of these classes of college students—those who pass from a college into active non-professional life, and those who enter upon non-professional training in research work—it seems unneces-

[1] Paper read at the Conference on the Relation of the College to the Professional School, held in the Northwestern University Building, Chicago, May 8 and 9, 1903. The questions discussed were: (1) Has the college a field peculiar to itself, not covered by the technical school or by the demands of preparation for the professional school? (2) Is it desirable that the college course should be reduced in time from four to three or even to two years and correspondingly in amount of work? (3) What subjects in the typical college course can be accepted by the professional school as qualifying in part for the professional degree, so as to shorten the time required for graduation in the professional school? (4) If reduction is allowed, should it be (*a*) by acceptance of credits in the college for work done in the professional school or (*b*) by acceptance of credits in the professional school for work done in the college or (*c*) by combining these plans? (5) The relation of the technical school to the college.

This paper opened the discussion of the fourth question.

sary and undesirable to diminish the amount of work required for the college degree. It is also undesirable, I think, that the course should be shortened in time, unless the results that are now obtained in four years can be substantially obtained, as regards the average student, in three years. Such a change—such an acceleration of the pace of study that the four-year course shall be run instead of walked, and run in the average time of three years—is perhaps possible; but after listening to Dr. Merrill's charming apology for leisure I am inclined to concede that it is undesirable. And even before hearing Dr. Merrill's argument, I was convinced that the scheme of compressing four years' work into three years would mean a change in the habits of college undergraduates and a breach of the traditions of the college so great as to be almost revolutionary. I doubt, therefore, whether the shortening of the college course to three years is feasible without a substantial diminution of work; and this, as I have already indicated, I do not think desirable.

What we have at present to consider, however, is the college course as a preparation for professional study. In the preceding discussion two different questions have been imperfectly separated: the question whether students who are already in college shall be encouraged to begin their professional studies before completing their college course, and the question whether students who are not in college, and who, of their own free will would not have come to college—shall be forced to pursue a four-year college course in order to get into a university professional school.

These questions are indeed clearly related, and the answer which we give to the second question may determine the answer to the first; but it is desirable that they shall be examined separately. Considering that until recently all our professional schools, even our university professional schools, were open to high-school graduates, it does not seem to me desirable that a college degree, based on a four-year course, should be required for admission to all professional schools, nor even to all university professional schools, and I doubt whether it should be required for admission to any of them.

I speak with some hesitation as regards university schools of law because of the fact that both Harvard and Columbia are now requiring the first degree for admission to their law schools. I think, however, that if this policy be maintained in these universities, and adopted by other universities, it will become necessary to shorten the college course to three years. For this reason, I venture to disapprove of the step which these two universities have taken. At the same time, I recognize that the American law school stands in a peculiar relation to the college—a relation different from that occupied by the other professional schools. No other professional school leaves to the college an important part of its professional work. The great majority of our law schools, including many of our university law schools, do this very thing. They teach so much private law and so little public law that the young man who desires an all-round legal education must get most of his international law, much of his constitutional law, and his general view of national, state, and local administration, in the college. The same is true of Roman law, because the American law school almost always confines itself to Anglo-American law. In several of our universities, indeed, public law and Roman law are taught in a graduate school, and may be taken up by law students in connection with their professional studies; and in some of our law schools these subjects are obtaining recognition as portions of the law curriculum, usually as electives; but as things stand thruout the country generally, the majority of students who pass thru an American law school carry out little public law or comparative jurisprudence beyond what they may have brought in with them from college. As long as this state of things exists—as long as a student who intends to study law must resort to the college, not only for general preparation, but for an essential part of a well-rounded legal education—so long will there be a special reason why the college course preliminary to study in a law school should be longer than that which is required as a preparation for other professional schools.

It may perhaps be maintained that a somewhat similar state of things exists as regards theological education. The modern

clergyman is expected to know something about so many subjects that are not and perhaps cannot be taught in a theological seminary that perhaps we should say that he requires fully as long a preliminary college course as does the lawyer. But until it is decided what subjects should be taught in a theological seminary and what subjects should be excluded—and yesterday's discussion showed that the theological teachers are far from having reached agreement on this point—the relation of the theological seminary to the American college seems incapable of even theoretic adjustment.

For admission to the university law school, as the average university law school is now constituted, and perhaps also for admission to the theological school, when that shall become distinctly a university school, it seems to me that at least three years of college study should be required. If the law course shall be so modified as to give due space to instruction in public law, it will probably be necessary to extend that course to four years. In such case, when the law school shall do the work which it now leaves to the college, it may be proper to require only two years of preliminary college training.

For admission to the other professional schools we should require, I think, at least two years of college study. A liberal-scientific course, whether given in a college or in a scientific school of similar rank, should, however, be regarded as equivalent to a classical course. Two years of college or of liberal-scientific study and four years of medical or engineering study yield, it will be noted, the same total period as three years of college and three years of legal or theological study. The college and professional course for the professional degree, should not, I am sure, be less than six years; and when we consider the average age of entrance into college, I am inclined to think that not more than six years should be required.

If, now, a four-year course be maintained for the college degree, or if the college course be shortened by one year only, and if college students be encouraged to begin their professional studies before the termination of the course required for the college degree, the first question that presents itself is: What policy shall we pursue as regards the college

degree? Shall we say to the student: You can obtain a liberal and a professional education in six years of combined college and professional study, but you shall have no academic recognition of your college work; or shall we accept a combined college and professional course for the first degree?

It seems to me that justice, as well as expediency, calls for the granting of the college degree on such a combined course. The linguistic and historical studies which usually figure in the first part of the theological course, and the general scientific studies which occupy the first year or two of a medical course or of an engineering course—these have long been recognized as college subjects. Conversely, as I have just pointed out, the American college is teaching some subjects which in every European and Spanish-American university are regarded, and which in this country are beginning to be regarded, as proper to the law school. Whether the college is trespassing on the professional field, or the professional school is encroaching on the field of the college, may be disputed; but there can be no doubt that their claims now overlap; and the point on which I desire to insist is this: that the degree of A. B. is now awarded, in all our colleges, on what is substantially a combined course—a course partly composed of the traditional college studies and partly of studies that are, or may be, regarded as professional. The proposal to give the degree of A. B., as well as the professional degree, on a six-year combined course, is simply a proposal that the student who has successfully pursued during four of these six years the study of subjects which are generally regarded as college subjects shall receive what he has earned, viz., the college degree.

These considerations, I think, dispose of the objection often heard that there is something dishonest in allowing studies that count for the professional degree to count for the college degree also. What is just cannot well be dishonest. The impression that there is any dishonesty in the combined course flows from the easy but baseless assumption that all the studies pursued in the professional school are purely professional studies, and are different in their nature from those pursued in the college.

There still remains, however, the question whether it is wise to encourage college students to begin their professional studies before completing a distinct four-year college course. It was said yesterday that no protest against the seven or eight years of college and professional study had come from the students. It is true that no such protest has come from the young men who have taken such a course. The protest has come from the tens of thousands of young men who have gone directly from the high school to the professional school. These have protested, dumbly but clearly, by simply giving up the college course as a thing beyond their reach. When we are planning to constrain these young men to enter college as the only avenue to the university professional schools, the silent protest of these non-graduates should be taken into account. The combined course is an answer to a real demand. That such a course *may* be taken by those who do not need to save money or time, does not mean that it *will* be taken by the majority of such students. In any case, this possibility is but a slight disadvantage that attends a greater good.

The last question which must be answered in planning a combined course (and this is the special question before us today) is whether studies falling in the debatable field—studies which are both college and professional studies and which, for convenience, we may call semi-professional studies—whether these studies may, to the best advantage, be pursued by the candidate for the two degrees in the professional school or in the college? These alternative solutions are indicated in the question, as drafted, by the letters *a* and *b*. If the first solution, *a*, is adopted, the college undergraduate, at the moment when he is permitted to begin his professional work, passes out of the college into the professional school, and work done in the professional school is accepted as an equivalent for the Senior or for the Junior and Senior work of the college. If the second solution, *b*, is adopted, the student anticipates in the college, under the elective system, studies which count toward the professional degree, and, after a full college course, he enters the professional school with advanced standing. In its practical working this latter arrangement may approximate so closely to the first

solution that the difference seems formal rather than substantial. If, in any year, a college student is permitted to elect, and does elect, *all* his work in a professional school, we have what may be termed solution *a* in disguise. The difference seems merely a matter of registration. It is, however, something more than that: it is a matter of jurisdiction and, what is more important, it is a matter of associations and influences.

In both of these plans there are advantages, some of which will suggest themselves to every college or professional instructor. I desire to dwell on a few advantages of plan *a*—the plan under which the student, at the moment at which his semi-professional or professional studies begin, severs his connection with the college and passes under the jurisdiction of the professional faculty and under the influences of the ideas and associations of the professional school.

In the first place, this is the only arrangement in which the smaller colleges can effectively co-operate. The smaller college may teach some of the semi-professional subjects as well as they are taught anywhere; but it cannot teach very many of these subjects as well as they are taught in the leading professional schools, nor can it teach all of them. To make the combined course generally effective as between the independent colleges and the professional schools, the student must sever his connection with the college at the close of his Sophomore or Junior year, and migrate to the professional school.

Even in the universities—I use this term to designate the institutions which include a college, a non-professional graduate school, and a number of professional schools—even in the universities, where the college can expand its list of electives almost indefinitely by the simple process of making professional-school courses college electives; where it seems a question of secondary importance whether a student shall do his semi-professional work piecemeal or all at once; and where it seems immaterial whether this work shall be done under the jurisdiction of the college faculty or of a professional faculty—even here there are distinct advantages in placing the semi-professional courses under the jurisdiction of the professional faculties.

A semi-professional subject may be taught—and for the particular purposes of the college, for the benefit of the undergraduates who do not intend to enter any of the recognized professions, it, perhaps, should be taught—without the slightest professional twist or leaning. But for the students who are to enter professions it will be of advantage that the semi-professional courses shall be taught with something of a professional aim. Take, for example, studies like chemistry and physics, which find different applications in medicine and in the other applied sciences. When a student has passed beyond the rudiments of chemistry or of physics, the professional teacher may begin to dwell more fully on those aspects and bearings of the science which are of chief importance in his profession. This may be done, I think, without sacrificing that indefinable property or accident which makes these studies "liberal," and gives them "culture-value." Such a method of teaching saves time in combined college and professional courses. I have instanced physics and chemistry; but what is true of them is true, I think, of all, or nearly all, the studies in the debatable semi-professional field.

Again, the pace of professional work is more rapid than that of college work. At Columbia we have been experimenting for thirteen years with combined courses. In 1890 we introduced solution *a* in disguised form, permitting Seniors to elect a full first year in any professional school, but keeping their names on the college roster. At first such students were compelled to take a course or two in the college, besides their professional work, but this is no longer required. In 1897 an arrangement was made by which college undergraduates, beginning with their Sophomore year, might elect, when they pleased, applied science studies to the total extent of two full years, and thus gain, after obtaining the degree of A. B., the standing of third-year students in the Schools of Applied Science. A recent inquest, in which the opinions of all the members of the different university faculties were solicited on this and on other matters, has brought out the fact that the instructors in the professional schools are not wholly satisfied with the result of these experiments. Many of them complain

that the college undergraduates who elect professional studies do not do as good work as the students who are primarily registered in the professional schools. Because they are still college undergraduates they find it difficult to escape the numerous distractions of college life in the way of social, literary, dramatic, musical, and athletic activities.

This means that, if the combined course is to be wholly successful, one of two things must be done. Either the pace of college work must be accelerated (and this, as we have seen, will be difficult), or the students who, at the close of their Sophomore or Junior year, are permitted to elect professional studies must sever their connection with the college, altho they remain candidates for the degree of A. B. Under such an arrangement the first degree would be awarded on the recommendation of the college as regards work done in the college, and on the recommendation of the professional faculty as regards work done in the professional school.

Where both college and professional school are parts of the same university, the situation will be simple. If, however, the student does his college work at one institution and his professional work at another, the problem of the degree is more complicated. Shall the university to which the student has migrated give him the college degree, or shall his original college give him its degree, on a certificate from the university in which he has pursued his professional studies? Or, if he has studied in an independent professional school, shall his original college give him his degree on a certificate from that professional school?

It is evident that the latter arrangement is the only one that puts the independent professional school (which cannot give the degree of A. B.) on the same footing as the university professional school. Apart from this consideration, however, and simply as between the university and the independent college, it seems much fairer that the student should receive his college degree from his original college.[2] To an arrangement by

[2] This arrangement was suggested by Professor Hamlin of Columbia University, in a letter to President Butler, in connection with the inquest to which reference is made above.

which the university should give him its college degree there is a double objection: (1) The university appears to be robbing the independent college of its alumni. (2) The university introduces into its own college alumni association a body felt to be alien, composed of students who hold its first degree, indeed, but who have never studied in its college.

The arrangement which I advocate involves the assent and co-operation of the independent colleges. Should they give this co-operation? If the change is in the interest of American education, they should accept it without narrowly reckoning the advantage or disadvantage to themselves. I firmly believe, however, that to them the gain resulting from such co-operation will far outweigh any loss it may entail.

In the first place, it will preserve their independence. The co-ordination of college study with professional study in the university is, I think, necessary, and if necessary it is sure to come. It may be attained either by that voluntary co-operation for which I am pleading, and which is analogous to what is known in the economic world as a traffic arrangement; or it may come thru a subordination of the smaller colleges to the universities in a sort of educational trust. This latter method of co-ordination has already appeared in the so-called "affiliation." Both in economic and in educational affairs traffic arrangements seem to me preferable to trusts.

In the second place the arrangements which I have outlined will, I think, increase the number of students in the independent colleges. The mere possibility of completing the college and the professional course in six years, will draw into the colleges thousands of students who now go directly from the high school to the professional school. The requirement of preliminary college study for admission to the university professional schools will force into the college all those who wish to get professional education of the highest type. The independent colleges will get their share of this increment if they co-operate with the universities in the way here suggested. Each of them will be able to offer to students all the advantages associated with entrance into a university college. The net result, then, it seems to me, will be this: the independent col-

lege will lose a few students from the Junior and Senior classes who, but for the reciprocity arrangement with the universities, would have remained in the independent college for four years; but it will gain in exchange many students who, but for the shortened combined course, would not have entered college at all, and many more who, but for the reciprocity arrangement, would have entered a university college.

I have just affirmed that no large number of students will be drawn from the Junior and Senior classes of the college into the professional schools. In the discussion of this problem it is sometimes apparently assumed that the combined course is going to take the entire top story off the college edifice. If that were so, it would disprove what was so emphatically asserted in a preceding session of this conference—that the college has a peculiar field of its own. But it is not true. In the first place, not all those who propose to enter a professional school will do this at the earliest moment. Those who can afford the luxury will stay in the college for the full four years. This has been the result of our experience at Columbia. In the second place, those who do not propose to enter a professional school —those who are going on for graduate non-professional work, and those who are going out into active non-professional life —will stay thru the four years. In our experience at Columbia the proportion of the members of the Senior class who devote all their time to study in a professional school is, on the average, only one-fourth.[3]

It would be absurd to claim that the arrangements under

[3] During the decade 1892–1902 the percentage of Columbia College Seniors who took a full year's work in a professional school was as follows :

1892–93	27.7 per cent.	1897–98	25 per cent.
1893–94	39.4 " "	1898–99	20.7 " "
1894–95	44.9 " "	1899–1900	25.8 " "
1895–96	24.1 " "	1900–01	15.7 " "
1896–97	17.3 " "	1901–02	27.6 " "

The large percentages in the years 1893–94 and 1894–95 were presumably due to economic causes : to the financial crisis of 1893 and the following depression. During these two years many students who would otherwise have taken the full college course before beginning professional study were constrained to take advantage of the opportunity to save a year. The average percentage for the decade was 26.8 : eliminating these two years, it was 23.

which we are working at Columbia are likely to prove a permanent solution of the problems presented. It is doubtful whether, in the present confused and changing conditions, any solution can be devised that will offer promise of permanence. What I claim for the combined course is adaptation to existing conditions and flexibility of application. Its greatest advantage is that it preserves the four-year college course for all students except those who propose to enter a professional school, and who are obliged to enter it at an early period. The combined course does not shorten the college course, it only broadens it. The college course remains a four-year course and a liberal course, but it becomes a course of ampler opportunities.

MUNROE SMITH

COLUMBIA UNIVERSITY

VI

COLLEGE ENTRANCE EXAMINATION BOARD

THIRD ANNUAL REPORT OF THE SECRETARY
THE EXAMINATIONS OF 1903

Organization

At the third annual meeting of the College Entrance Examination Board, held at Columbia University, New York, November 8, 1902, President Butler of Columbia University was re-elected chairman; Professor Tyler of the Massachusetts Institute of Technology was elected vice-chairman; Joseph C. Hendrix of the National Bank of Commerce, New York, was re-elected treasurer; and Professor Fiske of Columbia University was re-elected secretary. Dean Crane of Cornell University, President Woolley of Mount Holyoke College, and Mr. Croswell of the Brearley School were elected to serve with the chairman and vice-chairman as members of the executive committee.

At the same meeting an application for admission to the Board was received from the Case School of Applied Science of Cleveland, Ohio, which announced that it had discontinued its system of admission by certificate and was about to adopt a system of admission by examination only. It was resolved to admit the Case School of Applied Science to the Board, and the following resolution was adopted:

Resolved, That the plan of organization and constitution of the Board be so amended in sections 1 and 3 as to recognize a larger field for membership in this Board and to adjust questions of membership of representatives of secondary schools other than in the Middle States and Maryland; and that a special committee be appointed to draft amendments to this effect to be submitted to this Board at the May meeting for vote in accordance with section 13.

At the meeting of the Board held May 16, 1903, the committee provided for in the preceding resolution recommended that section 1 be amended to read as follows:

The College Entrance Examination Board shall consist of the president or an authorized representative of each participating college or university and of representatives of secondary schools.

Any college or university in the United States, which has a freshman or entering class of not less than fifty students (courses in arts and sciences to be reckoned together for this purpose) may, by vote of this Board, be admitted to membership.

The representatives of the secondary schools shall be appointed in such manner as the association choosing them may direct by

The New England Association of Colleges and Preparatory Schools;

The Association of Colleges and Preparatory Schools of the Middle States and Maryland;

The Southern Association of Colleges and Preparatory Schools;

The North Central Association of Colleges and Preparatory Schools; and such other similar associations as may hereafter be recognized by this Board. Each association may appoint one secondary-school representative for every three colleges and universities members of this Board and represented in such association, provided, however, that one representative may be appointed on the admission to this Board of one such college or university, and provided further, that the number of secondary-school representatives appointed by any one association shall in no case exceed five.

The preceding recommendation will be acted upon at the annual meeting of the Board to be held Saturday, November 7, 1903.

At the annual meeting of the Association of Colleges and Preparatory Schools of the Middle States and Maryland held in Baltimore, November 29, 1902, the following representatives of the secondary schools were elected to serve upon the Board during the year ending November 30, 1903: Julius Sachs of New York, N. Y.; Wilson Farrand of Newark, N. J.; Simon J. McPherson of Lawrenceville, N. J.; James L. Patterson of Philadelphia, Pa.; and James G. Croswell of New York, N. Y.

During the past year the membership of the Board has been enlarged by the admission of two new members: the Case School of Applied Science of Cleveland, Ohio, and Adelphi College of Brooklyn, N. Y.

Publications

In addition to the publications mentioned in previous reports of the secretary the following have been issued to date:

SECOND ANNUAL REPORT OF THE SECRETARY, . SEPTEMBER 1, 1902

This report published in the EDUCATIONAL REVIEW for October, 1902, was also printed separately for free distribution among those interested in the work of the Board. It gives an account of the operations of the Board during the second year of its existence and is accompanied by statistical tables showing in detail the more important results of the examinations.

EXAMINATION QUESTIONS OF 1902, . . SEPTEMBER 15, 1902

This volume, published for the Board by Ginn & Co., may be obtained thru any bookseller for sixty cents a copy. It contains all the question papers of 1902, together with the names of the examiners who framed the questions in each subject and of the readers who rated the answer-books in each subject. It contains also a brief account of the organization and aims of the Board.

DOCUMENT NO. 11, ... DECEMBER 1, 1902

This document contains a list of the subjects in which examinations were offered in 1903, the time schedule of the examinations held June 15-20, and instructions to candidates and teachers.

DOCUMENT NO. 12, ... JANUARY 10, 1903

This document contains the constitution and plan of organization of the Board, the list of subjects in which examinations were offered in 1903, detailed definitions of the requirements in each subject, the names of the examiners appointed to frame the questions for use at the examinations of 1903, the time schedule of the examinations held June 15-20, 1903, and instructions to candidates and teachers. A copy of this document will be sent to any address upon receipt of ten cents in postage stamps.

DOCUMENT NO. 13, ... MARCH 15, 1903

List of places at which arrangements were made for holding examinations June 15-20, 1903.

DOCUMENT NO. 14, ... APRIL 1, 1903

Instructions to supervisors in charge of examinations.

DOCUMENT NO. 15, ... AUGUST 1, 1903

List of subjects in which examinations will be offered in 1904, time schedule of the examinations to be held June 20-25, 1904, and revised instructions to candidates and teachers.

EXAMINATION QUESTIONS OF 1903, . . . AUGUST 15, 1903

This volume, published for the Board by Ginn & Co., may be obtained thru any bookseller for sixty cents a copy. It is similar in form to the previous volumes of examination questions. It contains 116 pages and is provided with an index.

Administration

A modification was made in the blank of application used for the examinations of this year, whereby the detachable second sheet gave the college information as to what subjects had been offered by the candidates with the teacher's approval. In this way it was made possible for each college to carry out its own policy with respect to examinations taken by candidates without the authorization of their teachers.

An administrative regulation was suggested in the second annual report of the secretary and adopted at the last annual meeting of the Board, to the effect that an extra fee of five dollars should be required of candidates failing to file their applications on or before the dates specified in the publications of the Board. This regulation was adopted not for the purpose of increasing the revenues of the Board, but simply to bring more effectively to the attention of candidates the desirability of conforming to its published requirements. Of the 1620 candidates presenting themselves for examination this year, over one hundred were obliged, under the operation of this regulation, to pay an extra fee.

It is worthy of note, however, that the applications filed by candidates this year were in general filled out much more accurately and intelligently than in previous years. Candidates and their teachers are becoming more familiar with the forms and the methods of the Board. Notwithstanding the fact that the number of candidates this year exceeded last year's number by more than two hundred and fifty, the number of applications incorrectly or incompletely filled out was this year far less than last year.

There has been an increased use of the Board's examinations as a basis for the award of competitive scholarships, and information has come to the secretary that at a number of points local influences are working for the establishment of new scholarships to be awarded on the basis of the examinations.

Four institutions—Adelphi College, Colgate University, Mount Holyoke College, and Wellesley College—have definitely withdrawn their separate examinations hitherto held

in June, bringing the number of institutions that have taken this action up to ten. The Massachusetts Institute of Technology this year for the first time held no entrance examinations outside of Boston, and one hundred young men were examined by the Board for admission to that institution.

The secretary was much concerned this year to learn that thru a lack of sufficient information in regard to the examinations of the Board many candidates, to whom the examinations would have been most useful, were prevented from taking them. Even after the close of the examinations, the secretary received a considerable number of letters inquiring as to the dates of the examinations and the places at which they were to be held. It seems very desirable that the colleges and universities accepting the examinations of the Board should make more adequate announcements in their circulars of information. They should publish, at least, the dates of the examinations, and a statement that an application upon a blank form, to be obtained from the secretary of the Board, must be filed at a specified period in advance of the examinations.

Work of the Examiners

The examiners for 1903 were appointed before the close of December, 1902, so that work upon most of the question papers was begun during the Christmas holidays. The full list of examiners for 1903 was as follows:

BOTANY

William Francis Ganong .....Professor of Botany, Smith College
University of New Brunswick, A. B., 1884, and A. M., 1886; Harvard University, A. B., 1887; University of Munich, Ph. D., 1894.

Byron David Halsted.....Professor of Botany and Horticulture, Rutgers College
Michigan State College, B. S., 1871, and M. S., 1874; Harvard University, S. D., 1878.

Edward Lyman Morris, Head of the Department of Biology, Washington High Schools, Washington, D. C.
Amherst College, A. B., 1891, and A. M., 1895.

CHEMISTRY

Henry Paul Talbot, Professor of Analytical Chemistry, Massachusetts Institute of Technology
Massachusetts Institute of Technology, S. B., 1885; Leipsic University, Ph. D., 1890.

Leverett Mears..... .....Professor of Chemistry, Williams College
Amherst College, A. B., 1874; Göttingen, Ph. D., 1876; Williams College, M. A., 1888.

Albert C. Hale.....Teacher in the Boys' High School, Brooklyn, N. Y.
University of Rochester, A. M., 1872; University of Heidelberg, Ph. D., 1880.

DRAWING

John Henry Barr.....Professor of Machine Design, Cornell University
University of Minnesota, B. M. E., 1883, and M. S., 1888; Cornell University, M. M. E., 1889.

Alfred Dwight Foster Hamlin, Adjunct Professor of Architecture, Columbia University.
Amherst College, A. B., 1875, and A. M., 1885.

Manton Elwell Merchant, Teacher in the Erasmus Hall High School, Brooklyn, N. Y.

ENGLISH

Francis Hovey Stoddard.....Professor of English, New York University
Amherst College, A. B., 1869, and A. M., 1886.

Edward Everett Hale, Jr. .....Professor of Rhetoric and Logic, Union College
Harvard University, A. B., 1883; University of Halle, Ph. D., 1892.

Helen Josephine Robins.....Teacher in Miss Baldwin's School, Bryn Mawr, Pa.
Bryn Mawr College, A. B., 1892.

FRENCH

Edwin Seelye Lewis.....Professor of Romance Languages, Princeton University
Wabash College, A. B., 1888, and A. M., 1891; Johns Hopkins University, Ph. D., 1892.

Jean Charlemagne Bracq.....Professor of Modern Languages, Vassar College
McGill University, A. B., 1881.

Isidore Henry Bowles Spiers, Teacher in William Penn Charter School, Philadelphia, Pa.
Oxford University, B. A., 1878, and M. A., 1880.

GEOGRAPHY

Albert Perry Brigham, Professor of Geology and Natural History, Colgate University.
Colgate University, A. B., 1879, and A. M., 1882; Harvard University, A. M., 1892.

William North Rice.....Professor of Geology, Wesleyan University
Wesleyan University, A. B., 1865; Yale University, Ph., D., 1867; Syracuse University, LL. D., 1886.

Frank Carney.....Vice-Principal of the Ithaca High School, Ithaca, N. Y.
Cornell University, A. B., 1902.

GERMAN

Marion Dexter Learned.....Professor of German, University of Pennsylvania
Dickinson College, A. B., 1880, and A. M., 1883; Johns Hopkins University, Ph. D., 1887.

Hans Froelicher .....Professor of German, Woman's College of Baltimore
University of Zürich, Ph. D., 1888.

Thomas Bertrand Bronson, Teacher in Lawrenceville School, Lawrenceville, N. J.
University of Michigan, A. B., 1881, and A. M., 1886.

GREEK

Herbert Weir Smyth.....Professor of Greek, Harvard University
Swarthmore College, A. B., 1876; Harvard University, A. B., 1878; University of Göttingen, Ph. D., 1884.

Edward Henry Spieker, Associate Professor of Greek and Latin, Johns Hopkins University
Johns Hopkins University, A. B., 1879, and Ph. D., 1882.

Robert Porter Keep.....Principal of the Norwich Academy, Norwich, Conn.
Yale University, B. A., 1865, and Ph. D., 1869.

HISTORY

Lucy Maynard Salmon.....Professor of History, Vassar College
University of Michigan, A. B., 1876, and A. M., 1883.

William Isaac Hull.....Professor of History, Swarthmore College
Johns Hopkins University, A. B., 1889, and Ph. D., 1892.

Henry Pitt Warren.....Headmaster of the Albany Academy, Albany, N. Y.
Yale University, A. B., 1870; Rutgers College, L. H. D., 1893.

LATIN

Charles Edwin Bennett..... Professor of Latin, Cornell University
Brown University, A. B., 1878.

John Howell Westcott.....Musgrave Professor of Latin, Princeton University
Princeton University, A. B., 1877; A. M., 1880, and Ph. D., 1887.

William Henry Klapp..Headmaster of the Episcopal Academy, Philadelphia, Pa.
Harvard University, A. B., 1871; University of Pennsylvania, M. D., 1876.

MATHEMATICS

Charlotte Angas Scott.....Professor of Mathematics, Bryn Mawr College
University of London, B. Sc., 1882; D. Sc., 1885.

William Henry Metzler.....Professor of Mathematics, Syracuse University
Toronto University, A. B., 1888; Clark University, Ph. D., 1892.

John S. French.....Teacher in the Jacob Tome Institute, Port Deposit, Md.
Bowdoin College, A. B., 1895; Clark University, Ph. D., 1898.

PHYSICS

Edward Leamington Nichols.....Professor of Physics, Cornell University
Cornell University, B. S., 1875; University of Göttingen, Ph. D., 1879.

William Suddards Franklin.....Professor of Physics, Lehigh University
University of Kansas, B. S., 1887, and M. S., 1888; Cornell University, D. Sc., 1901.

Frank Rollins.....Teacher in the Morris High School, New York, N. Y.
Wesleyan University, A. B., 1889; Columbia University, Ph. D., 1902.

SPANISH

Hugo Albert Rennert, Professor of Romanic Languages and Literatures, University of Pennsylvania.
University of Pennsylvania, B. Sc., 1876, LL. B., 1881, and M. A., 1890; University of Freiburg, Ph. D., 1892.

Fonger DeHaan.....Associate Professor of Spanish, Bryn Mawr College
Johns Hopkins University, Ph. D., 1895.

Federico Edelmann, Teacher in the DeWitt Clinton High School, New York, N. Y.

As in previous years, suggestions relative to the examinations received from various sources by the secretary, were submitted to the examiners and proved to be of great value.

The secretary cannot too strongly urge that teachers and others interested in the examinations, will continue to give the Board the benefit of their advice and assistance.

The committee on revision conducted its operations on a plan somewhat different from that pursued in previous years. The five representatives of the secondary schools met on February 21 to make a preliminary examination of the question papers submitted by the examiners. The day was spent in a careful study of the papers, and as a result the secretary was able to transmit to the examiners a number of important suggestions. On March 6 the entire committee, consisting of the thirteen chief examiners and the five representatives of the secondary schools, met to pass finally upon the questions. The committee at first met in two sections, one section considering the papers in Latin, Greek, French, German, and Spanish, the other section considering the papers in mathematics, physics, chemistry, botany, geography, and drawing. The papers in history and English were then considered in joint session, and before adjournment a number of points relative to the other papers were also discussed in the committee of the whole. All of the members of the committee on revision felt that the work of the committee was done much more effectively by reason of the new arrangements made this year.

The Examinations

The examinations were held during the week beginning Monday, June 15, in accordance with the time schedule printed on pages 44-45 of Document No. 12. The total number of candidates examined was 1620, an increase of 258 over the number examined in 1902. The increase in the number of candidates outside of the Middle States and Maryland is especially noteworthy, being at the rate of almost 54 per cent.

The examinations were held at 134 points, of which 128 were in the United States, five in Europe, and one in South America, as shown in the following table:

TABLE I

PLACES AT WHICH EXAMINATIONS WERE HELD JUNE 15–20, 1903, AND THE NUMBER OF CANDIDATES FOR EXAMINATION AT EACH PLACE

NORTH ATLANTIC DIVISION

Maine:
- Bangor 0
- Portland 15

— 15

New Hampshire:
- Concord 0
- Exeter 8

— 8

Vermont:
- Burlington 1
- Saxton's River 0

— 1

Massachusetts:
- Adams 13
- Boston 42
- Fall River 2
- Great Barrington 2
- Norwood 5
- South Hadley 10
- Springfield 27
- Wellesley 16
- Worcester 8

—125

Rhode Island:
- Providence 4

Connecticut:
- Bridgeport 18
- Hartford 14
- Lakeville 9
- New Haven 13
- New London 1
- Pomfret Center 0
- Salisbury 2
- Stamford 14

— 71

New York:
- Albany 7
- Binghamton 6
- Brooklyn 75
- Buffalo 13
- Elmira 2

New York—*Continued*:
- Geneva 1
- Hamilton 2
- Ithaca 51
- Lake Placid 2
- Manlius 7
- New Paltz 2
- New York:
  - Barnard College 194
  - Columbia University 434
  - New York University:
    - University Heights 3
    - Washington Square 32
- Ossining 6
- Port Richmond 1
- Poughkeepsie 25
- Rochester 7
- Schenectady 2
- Syracuse 11
- Utica 7
- Watertown 2

——892

New Jersey:
- Asbury Park 5
- Bordentown 19
- Jersey City 8
- Morristown 11
- Newark 33
- New Brunswick 10
- Paterson 7
- Plainfield 10
- Princeton 9
- Trenton 9

—121

Pennsylvania:
- Allegheny 29
- Bethlehem 3
- Bradford 3
- Erie 1
- Harrisburg 1
- Lancaster 11
- Mercersburg 6
- Pennsburg 1
- Philadelphia 29
- Reading 1

Pennsylvania:
- Uniontown 3
- Warren 2
- Washington 0
- Wilkes-Barre 8
- Williamsport 3

—101

South Atlantic Division

Delaware:
- Wilmington 1

Maryland:
- Baltimore 15
- Port Deposit 7

— 22

District of Columbia:
- Washington 19

Virginia:
- Atlantic City 1

West Virginia 0

North Carolina:
- Asheville 2
- Warrenton 1

— 3

South Carolina 0

Georgia:
- Atlanta 0
- Savannah 3

— 3

Florida:
- Jacksonville 0

South Central Division

Kentucky:
- Louisville 18

Tennessee:
- Chattanooga 1
- Memphis 2
- Nashville 1

— 4

Alabama:
- Mobile 0
- Montgomery 5

— 5

Mississippi 0

Louisiana:
- Monroe 2

Texas:
- Austin 1
- El Paso 2
- Houston 2

— 5

Arkansas:
- Little Rock 2

Oklahoma 0

Indian Territory 0

North Central Division

Ohio:
- Akron 4
- Cincinnati 8
- Cleveland 37
- Columbus 2
- Toledo 0
- Youngstown 7

— 58

Indiana:
- Fort Wayne 3
- Indianapolis 3

— 6

Illinois:
- Chicago 48
- Rock Island 4

— 52

Michigan:
- Albion 1
- Detroit 6

— 7

Wisconsin:
- Milwaukee 6

Minnesota:
- Duluth 3
- Faribault 5
- Princeton 1
- St. Paul 3

— 12

Iowa:
- Dubuque 1
- Newton 1
- Sioux City 0

— 2

Missouri :		California :	
Kansas City	8	Belmont	6
St. Louis	3	Los Angeles	2
	— 11	Nordhoff	3
North Dakota	0	San Mateo	2
South Dakota	0		— 13
Nebraska :		INSULAR TERRITORIES AND DEPENDENCIES	
Omaha	2	Hawaii :	
Kansas	0	Honolulu	10
WESTERN DIVISION		Porto Rico :	
Montana :		Ponce	0
Helena	1	San Juan	0
Wyoming	0		— 0
Colorado :		FOREIGN	
Denver	7	England :	
Pueblo	1	London	2
	— 8	France :	
New Mexico	0	Paris	1
Arizona	0	Germany :	
Utah :		Dresden	2
Salt Lake City	1	Strassburg	0
Nevada	0		— 2
Idaho	0	Switzerland :	
Washington	0	Geneva	1
Oregon :		Uruguay :	
Portland	1	Montevideo	1
			1620

The following table classifies the candidates for examination according to residence:

TABLE II

CANDIDATES FOR EXAMINATION CLASSIFIED ACCORDING TO RESIDENCE

RESIDENCE	NUMBER	RESIDENCE	NUMBER
NORTH ATLANTIC DIVISION		SOUTH ATLANTIC DIVISION	
Maine	18	Delaware	1
New Hampshire	6	Maryland	22
Vermont	4	District of Columbia	12
Massachusetts	108	Virginia	7
Rhode Island	5	West Virginia	2
Connecticut	63	North Carolina	2
New York	800	South Carolina	0
New Jersey	159	Georgia	3
Pennsylvania	102	Florida	2
	—1265		— 51

Residence	Number	Residence	Number
North Central Division		Western Division	
Ohio	74	Montana	3
Indiana	7	Wyoming	0
Illinois	49	Colorado	12
Michigan	15	New Mexico	1
Wisconsin	11	Arizona	0
Minnesota	11	Utah	4
Iowa	4	Nevada	0
Missouri	11	Idaho	0
North Dakota	1	Washington	1
South Dakota	1	Oregon	2
Nebraska	4	California	12
Kansas	2		— 35
	— 190	Insular Territories and Dependencies	
		Hawaii	10
		Porto Rico	0
			— 10
South Central Division		Foreign	
		Cuba	2
Kentucky	20	England	1
Tennessee	4	France	1
Alabama	6	Germany	0
Mississippi	6	Japan	1
Louisiana	2	Mexico	1
Texas	10	Switzerland	1
Arkansas	4		— 7
Oklahoma	0	Residence not given	10
Indian Territory	0		1620
	— 52		

The following table classifies the candidates for examination according to age:

TABLE III

Candidates for Examination Classified according to Age

Age	Number of Candidates
Fourteen years	8
Fifteen "	99
Sixteen "	254
Seventeen "	449
Eighteen "	373
Nineteen "	230
Twenty "	91
Twenty-one "	31
Twenty-two "	18
Twenty-three "	12
Twenty-four "	8
Twenty-five "	4

Age	Number of Candidates
Twenty-six "	2
Twenty-seven "	2
Twenty-eight "	0
Twenty-nine "	2
Thirty "	2
Thirty-one "	2
Thirty-two "	2
Thirty-three "	2
Thirty-four "	1
Thirty-six "	1
Thirty-eight "	1
Thirty-nine "	1
Forty-nine "	1
Fifty-three "	1
Age not stated	23
	1620

The following table classifies the candidates for examination according to the secondary school attended:

TABLE IV

Candidates for Examination Classified according to Schools

North Atlantic Division

Maine:		
Auburn	Edward Little High School	2
Bethel	Gould Academy	1
New Castle	Lincoln Academy	1
Portland	High School	9
	The Waynflete School	1
Westbrook	High School	1
New Hampshire:		
Concord	St. Paul's School	7
Exeter	Phillips Exeter Academy	5
Gorham	High School	1
Nashua	High School	1
Plymouth	Holderness School	1
Massachusetts:		
Adams	High School	1
Amesbury	High School	2
Andover	Phillips Academy	2
Ashburnham	Cushing Academy	2
Boston	Classical School for Girls	3
	English High School	1
	Emerson's (Miss) School for Girls	1
	Winsor's (Miss) School	1
Braintree	High School	1

Cambridge	Country School	1
	Gilman School	1
	High School	1
	Ingol's (Miss) School	1
	Latin School	2
Chelmsford	High School	1
Chicopee	High School	1
Dorchester	Shawmut School	1
Duxbury	Powder Point School	1
Gloucester	High School	2
Grafton	High School	1
Great Barrington	Searles High School	1
Groton	Groton School	2
Holliston	High School	1
Holyoke	High School	4
Hudson	High School	2
Ipswich	Manning High School	1
Lawrence	High School	1
Leicester	High School	1
Lenox	High School	1
Littleton	High School	2
Lowell	Hill's (Miss) Private School	1
Ludlow	High School	1
Natick	Walnut Hill School	5
North Adams	Drury High School	12
Northampton	High School	4
	Burnham School for Girls	1
Northfield	Northfield Seminary	7
Norton	Wheaton Seminary	2
Norwood	High School	4
Pepperel	High School	1
Pittsfield	High School	2
	Hall School for Girls	3
Roxbury	High School	1
Salem	High School	1
Saugus	High School	2
South Braintree	Thayer Academy	2
Springfield	Central High School	9
	Mechanic Arts High School	1
	St. Joseph's Normal College	1
Swampscott	High School	2
Taunton	High School	1
Waltham	High School	1
Wellesley	Dana Hall	1
West Newton	Allen School	1
	High School	1
West Springfield	High School	3
Weymouth	High School	1
Worcester	High School	3
	Worcester Academy	3
	Highland Military Academy	1

Rhode Island :		
Providence	University School	1
	Lincoln School	1
	Manual Training High School	1
Connecticut :		
Branford	High School	1
Bridgeport	High School	16
Enfield	High School	1
Hartford	High School	4
Lakeville	Hotchkiss School	7
	Taconic School	2
Lynn	Boxwood School	1
Middletown	High School	1
New Haven	Hillhouse High School	4
	University School	2
New London	Williams Memorial Institute	1
Norwalk	Connecticut Military Academy	2
Rockville	High School	1
Salisbury	St. Austin's School	2
Seymour	High School	1
Simsbury	Bridge's (Mrs.) Private School	2
South Norwalk	High School	2
Stamford	Betts Academy	10
	Katharine Aiken School	1
	Manor School	2
Suffield	Suffield Academy	1
Torrington	High School	1
Wallingford	Choate School	1
Waterbury	High School	2
	St. Margaret's School	1
Watertown	Taft's School	2
West Hartford	High School	2
Winsted	Gilbert School	2
New York :		
Albany	High School	1
	Female Academy	1
	St. Agnes School	2
Auburn	Auburn Academic High School	1
Binghamton	High School	5
	Lady Jane Gray School	1
Brooklyn	Adelphi Academy	9
	Boys' High School	33
	Latin School	3
	Erasmus Hall High School	13
	Girls' High School	4
	Hall's (Miss) School	1
	Manual Training High School	2
	Polytechnic Preparatory School	16
	Pratt Institute	2

Buffalo	Franklin School	2
	Masten Park High School	1
	St. Margaret's School	2
	Underwood School	1
Canandaigua	Granger Place School	2
Cornwall	Cornwall Heights School	1
Cortland	State Normal School	1
Dobbs Ferry	Masters' (Misses) School	1
Elmira	Free Academy	1
Flushing	High School	1
Garden City	St. Paul's School	3
Geneva	De Lancey School	1
Hamilton	Colgate Academy	1
Irvington	High School	3
Ithaca	Cascadilla School	22
	High School	10
	University Preparatory School	2
Jamaica	State Normal School	2
Lawrence	High School	1
Lockport	High School	1
Manlius	St. John's School	7
Middle Granville	Union School	1
Montour Falls	Cook Academy	1
Mount Vernon	High School	2
	Lockwood Collegiate School	2
Newburg	Newburg Academy	2
New Brighton	Staten Island Academy	2
	Botsford's (Misses) School	1
New Paltz	State Normal School	2
New Rochelle	High School	2
New York	Allen School	3
	Barnard Classes	7
	Barnard School for Boys	11
	Barnard School for Girls	1
	Berkeley School	6
	Blake School	3
	Brearley School	8
	Browning School	1
	Chapin Collegiate School	2
	Coaching School	1
	College of the City of New York	5
	Collegiate School	6
	Columbia Grammar School	26
	Columbia Institute	4
	Comstock School	1
	Cooper Union	1
	Cutler School	11
	DeWitt Clinton High School	65
	Dwight School	12

New York	East Side Evening High School	2
	Ely's (Misses) School	2
	Ethical Culture School	6
	Finch's (Mrs.) School	1
	Friends' Seminary	4
	Gerrish's (Miss) School	3
	Groff School	4
	Hamilton Institute	1
	High School of Commerce	2
	Horace Mann School	64
	Irving School	9
	Jaudon's (Misses) School	1
	Kohut School	3
	Lake School	1
	Le Baron Drumm School	2
	Madison School for Girls	1
	Manhattan College	1
	Morgan's, Leslie (Mrs.) School	2
	Morningside School	1
	Morris High School	43
	Morse and Rogers School	3
	Nathan Hale School	2
	New York Collegiate Institute	1
	New York Preparatory School	6
	Normal College	1
	Ornstein's (Miss) Classes	5
	Park Avenue School	2
	Rayson's (Misses) School	4
	Rugby Military Academy	1
	Sachs's Collegiate Institute for Boys	24
	Sachs's Collegiate Institute for Girls	8
	Schmidt's Institute	1
	Senftner School	4
	St. Ann's School	2
	St. John Baptist School	1
	St. Mary's School	3
	Syms School	3
	Trinity School	31
	Wadleigh High School	28
	Woodbridge School	13
	Wright Oral School	1
Niagara Falls	High School	3
Nyack	Hudson River Military Academy	1
Ossining	Mount Pleasant Academy	6
Peekskill	Mohegan Lake School	4
	Peekskill Military Academy	2
	St. Gabriel's School	1
Phelps	High School	1
Plattsburg	High School	1

Port Richmond	High School	1
Poughkeepsie	High School	1
	Lyndon Hall	6
	Putnam Hall	7
	Quincy School	8
	Riverview Military Academy	1
Richmond Hill	High School	1
Riverhead	High School	1
Rochester	East High School	4
Rye	Rye Seminary	1
Saratoga	High School	1
Saugerties	High School	1
Scarsdale	St. David's Hall	1
Stapleton	High School	2
Syracuse	High School	4
	Classical School	1
	Jenner's Preparatory School	4
	University	1
Tarrytown	Irving Institute	3
	Hackley School	1
Troy	High School	1
	Emma Willard School	2
Union Springs	Oakwood Seminary	1
Utica	Balliol School	1
	Free Academy	2
	Utica Preparatory School	1
Warwick	Warwick Institute	1
Watertown	High School	2
	Benfield Snyder School	1
Webster	High School	1
West New Brighton	Westerleigh Collegiate Institute	2
White Plains	Strecker's (Miss) School	1
Woodside	High School	1
Yonkers	High School	20
	Halsted School	2

New Jersey :

Andover	Punchard School	1
Asbury Park	High School	1
Atlantic City	High School	1
Atlantic Highlands	High School	1
Bayonne	High School	1
	Bergen Point School	1
Bellville	High School	1
Belvidere	Belvidere Academy	1
Blairstown	Blair Academy	3
Bloomfield	High School	1
Bordentown	Bordentown Military Institute	17
Burlington	St. Mary's Hall	2
Dover	High School	2

East Orange	High School	7
Elizabeth	Battin High School	2
	Pingry School	1
	Vail-Dean School	1
Englewood	High School	2
Hoboken	Hoboken Academy	3
	High School	1
	Stevens School	3
Jersey City	Bergen School for Girls	2
	Hasbrouck Institute	3
	High School	5
Kearny	High School	1
Lawrenceville	Lawrenceville School	8
Long Branch	Chattle High School	1
Montclair	Cloverside School	1
	High School	4
	Military Academy	2
Moorestown	Public High School	1
	Moorestown Academy	1
Morristown	Dana's (Miss) School	2
	High School	2
	Morristown School	4
Newark	Craven's (Miss) School	1
	High School	7
	Newark Academy	13
New Brunswick	Anable's (Misses) School	1
	Rutgers Preparatory School	3
Orange	Beard's (Miss) School	1
	Carteret Academy	1
	High School	3
Passaic	High School	1
Paterson	Graves' (Miss) School	1
	High School	1
	Hoover's (Miss) School	3
	Paterson Academy	1
	Paterson Military School	1
Perth Amboy	High School	2
Plainfield	High School	4
	Leal's (Mr.) School	3
Princeton	High School	3
	Princeton School	5
Red Bank	High School	2
	Shrewsbury Academy	1
Rutherford	High School	1
Somerville	High School	1
Summit	Cedarcroft School	1
	High School	2
Trenton	New Jersey State Model School	1
Union	High School	1
Westfield	High School	4

Pennsylvania :

Allegheny	Allegheny Preparatory School	2
Bala	Roney's (Miss) School	1
Bangor	High School	1
Bethlehem	Bethlehem Preparatory School	2
	Moravian Seminary	1
Bloomsburg	State Normal School	1
Braddock	High School	2
Bradford	High School	3
Carbondale	High School	1
Clarion	State Normal School	1
Easton	Lerch's Preparatory School	1
East Stroudsburg	State Normal School	1
Erie	High School	1
Harrisburg	Sargeant-Bent School	1
Hazelton	High School	1
Hollidaysburg	High School	1
Johnstown	High School	1
Kingston	Wyoming Seminary	3
Lancaster	Franklin and Marshall Academy	1
	High School	1
	Stahr's (Miss) School	1
	Yeates School	3
Lebanon	High School	2
Lexington	Lexington Military Institute	1
Mercersburg	Mercersburg Academy	6
Millersville	State Normal School	1
Myerstown	Albright College	1
Newcastle	High School	1
Ogontz	Cheltenham Academy	2
	Ogontz School	1
Pennsburg	Perkiomen Seminary	1
Philadelphia	Blight School	1
	Brown Preparatory School	2
	Case and Child School	1
	Central High School	1
	Chestnut Hill Academy	1
	De Lancey School	1
	Episcopal Academy	2
	Friends' Central School	1
	High School for Girls	2
	Hill's (Miss) School	2
	Holman School for Girls	1
	North Eastern Manual Training High School	1
	William Penn Charter School	1
Pittsburg	Alinda College Preparatory School	3
	High School	3
	Shadyside Academy	4
Pottstown	Hill School	1

Scranton	Bryn Mawr School	1
Steelton	High School	1
Uniontown	Darlington's (Miss) School	3
Warren	Friday's (Miss) School	1
Wayne	St. Luke's School	3
Westtown	Westtown Boarding School	1
Wilkes-Barre	Wilkes-Barre Institute	3
Wilkinsburg	High School	1
York	York Collegiate Institute	1

SOUTH ATLANTIC DIVISION

Delaware :

Dover	Wilmington Conference Academy	1

Maryland :

Baltimore	Boys' Latin School	3
	Country School for Boys	1
	Girls' Latin School	1
	Marston's University School	1
	Russell's (Miss) School	1
	Western High School	4
Port Deposit	Jacob Tome Institute	9
Reistertown	Franklin High School	1

District of Columbia :

Washington	Central High School	4
	Emerson Institute	1
	Friends' Select School	2
	High School	1
	McKinley Manual Training School	2
	National Cathedral School	2
	Washington School	3

Virginia :

Locust Dale	Locust Dale Academy	3
Norfolk	High School	1
Richmond	McGuire's University School	1

North Carolina :

Asheville	Asheville School	1
Warrentown	High School	1

South Carolina :

Charleston	Female Seminary	1
Sans Souci	Sans Souci School	1

Georgia :

Savannah	Hartridge School	2
	Savannah Preparatory School	1

SOUTH CENTRAL DIVISION

Kentucky :

Bowling Green	Potter College	1

Louisville	Flexner School	2
	High School for Boys	1
	High School for Girls	9
	Semple Collegiate School	4
Tennessee.		
Memphis	St. Mary's School	2
Nashville	Vanderbilt University	1
Alabama:		
Montgomery	High School for Girls	2
	Starke's University School	3
Louisiana:		
Monroe	Ouachita Parish High School	1
Texas:		
Houston	Gray Grammar School	1
	High School	1
San Marcos	Coronal Institute	1
Arkansas:		
Little Rock	Peabody High School	2
North Central Division		
Ohio:		
Akron	High School	1
	Oak Place School	3
Canton	High School	1
Cincinnati	Collegiate School	1
	Franklin School	1
	Technical School	1
	Walnut Hill High School	2
Cleveland	Central High School	1
	Hathaway-Brown School	1
	Mittleberger's (Miss) School	6
	University School	27
	West High School	1
Columbus	Central High School	1
Delaware	High School	1
East Liverpool	High School	1
Gambier	Kenyon Military Academy	1
Oxford	Miami University	1
Salem	High School	1
Springfield	Wittenberger Academy	1
Warren	High School	1
Wellsville	High School	2
Youngstown	Rayen High School	4
Indiana:		
Anderson	High School	1
Fort Wayne	High School	2
Indianapolis	Manual Training High School	1
	Shortridge High School	1

Illinois :		
Austin	High School	2
Chicago	Armour Institute	1
	Francis Parker School	1
	Harvard School	1
	Hyde Park High School	2
	Kenwood Institute	2
	Kirkland School	5
	Laboratory School of University of Chicago	1
	Lakeview High School	1
	Latin School	1
	Manual Training School	2
	South Side Academy	1
	Stevon School	1
	University School for Boys	9
	University School for Girls	8
Highland Park	Northwestern Military Academy	1
Hinsdale	High School	1
Lake Forest	Ferry Hall	1
Monmouth	Monmouth High School	1
Morgan Park	Morgan Park Academy	1
Rock Island	High School	1
Michigan :		
Albion	Albion College	1
Bay City	High School	1
Detroit	Central High School	2
Grand Rapids	Central High School	3
Kalamazoo	High School	1
Lansing	High School	1
St. Joseph	High School	1
Wisconsin :		
Eau Claire	High School	1
Madison	University of Wisconsin	1
Milwaukee	Milwaukee Academy	1
	West Division High School	1
Oshkosh	High School	1
	Normal School	1
Stevens Point	High School	1
Minnesota :		
Detroit	High School	1
Duluth	High School	2
Faribault	Shattuck School	5
Princeton	High School	1
St. Paul	Annie Wright Seminary	1
Iowa :		
Davenport	High School	1
	St. Katharine's Hall	1
Dubuque	High School	1
Newton	High School	1

Missouri :		
Kansas City	Central High School	3
	Manual Training High School	1
	Prosso Academy	1
St. Louis	High School	2
	Smith Academy	1
Nebraska :		
Aurora	High School	2
Omaha	High School	1
Kansas:		
Lawrence	University of Kansas	1
WESTERN DIVISION		
Montana :		
Helena	High School	1
Colorado :		
Denver	East Side High School	2
	High School	2
	University School	1
Pueblo	High School	1
Utah :		
Salt Lake City	High School	1
Washington :		
Olympia	High School	1
California :		
Belmont	High School	2
Eureka	High School	1
Los Angeles	Girls' Collegiate School	1
Nordhoff	Thacher School	3
San Francisco	Lyceum Preparatory School	1
	Murison's (Miss) School	1
Santa Barbara	High School	1
Hawaii :		
Honolulu	High School	6
	Oahu College	4
FOREIGN		
Cuba :		
Havana	Havana Institute	1
England :		
Liverpool	Merchant Taylor's School	1
Bromsgrove	Bromsgrove School	1
France :		
Paris	Anglo-Saxon School	1

Germany:	
Dresden.....Franklin College	2
Haubinda (Saxe-Meiningen) Oberrealschule	2
Private Tutors	38
Preparatory School not stated	71
Barnard Students	2
Columbia Students	1
Cornell Students	4
Wellesley Students	1
Teachers College Students	2

The following table classifies the candidates for examination according to the class or type of preparatory school attended:

TABLE V

CANDIDATES FOR EXAMINATION CLASSIFIED ACCORDING TO TYPE OF SECONDARY SCHOOL ATTENDED

TYPE OF SCHOOL	NUMBER OF SCHOOLS	NUMBER OF CANDIDATES	
Public high schools	208	594	36.7 per cent.
Academies and endowed schools	75	310	19.2
Private schools	205	566	35.0
Normal schools	11	13	.8
Colleges	11	18	1.1
	510	1501	

Of the 119 candidates not accounted for in this table 38 were prepared for the examinations by private tutors, 10 were students who took the examinations for the purpose of removing entrance conditions, and 71 did not indicate the place of preparation.

The following table shows the several colleges and scientific schools to which the candidates for examination declared themselves to be seeking admission:

TABLE VI

INSTITUTIONS TO WHICH ADMISSION WAS SOUGHT BY CANDIDATES FOR EXAMINATION

Brown University	1
Bryn Mawr College	28
Case School of Applied Science	1

Cornell University		264
Academic Department	34	
Technical Schools	163	
Medical Department	4	
Law School	3	
Not stated	60	
Columbia University		654
Columbia College	204	
Schools of Applied Science	204	
Barnard College	187	
Teachers College	15	
College of Physicians and Surgeons	24	
Law School	2	
Not stated	18	
Dartmouth College		1
Harvard University		3
Johns Hopkins University		3
Lehigh University		3
Leland Stanford, Jr., University		2
Massachusetts Institute of Technology		99
Mount Holyoke College		58
New York University		14
University College	2	
School of Applied Science	6	
Medical Department	1	
Not stated	5	
Princeton University		28
Princeton College	12	
John C. Green Scientific School	11	
Not stated	5	
Purdue University		1
Smith College		20
Stevens Institute of Technology		2
Union University		4
University of California		5
University of Michigan		4
University of Pennsylvania		4
Vassar College		169
Wellesley College		93
Western Reserve University		1
Williams College		15
Woman's College of Baltimore		10
Yale University		24
Yale College	14	
Sheffield Scientific School	10	
Preference not stated		109
		1620

Work of the Readers

As in previous years, the readers assembled at the offices of the Board in New York, to perform the work of reading and rating the answer-books. By this arrangement it was made easy, not only to secure uniformity of standards, but also to practice the greatest possible economy of time. The reading of the answer-books began at 9 o'clock a. m., on Tuesday, June 16, and continued in some subjects until the close of the following week. The names of the readers are given in the following list:

BOTANY

Willard Winfield Rowlee.....Assistant Professor of Botany, Cornell University
Cornell University, B. L., 1888, and D. Sc., 1893.

Elizabeth Carss..... Principal of the Charlton School, New York, N. Y.
Cornell University, Ph. B., 1895.

CHEMISTRY

Robert William Hall....Professor of Analytical Chemistry, New York University
Princeton University, A. B., 1873, and A. M., 1876; Columbia University, E. M., 1876.

Charles Morse Allen....Instructor in Chemistry, Pratt Institute, Brooklyn, N. Y.
Wesleyan University, A. B., 1882, and A. M., 1886.

Victor John Chambers.....Tutor in Organic Chemistry, Columbia University
University of Rochester, B. S., 1895; Johns Hopkins University, Ph. D., 1901.

James Flack Norris, Assistant Professor of Organic Chemistry, Massachusetts Institute of Technology
Johns Hopkins University, A. B., 1892, and Ph. D., 1895.

DRAWING

Ralph Edward Mayer, Adjunct Professor of Mechanical Engineering, Columbia University
Columbia University, C. E., 1879.

George Holston....Instructor in Drawing, Columbia Grammar School, New York, N. Y.

ENGLISH

George Clinton Densmore Odell, Adjunct Professor of English, Columbia University
Columbia University, A. B., 1889; A. M., 1890, and Ph. D., 1893.

Margaret Ball..... .....Instructor in English, Mount Holyoke College
Mount Holyoke College, A. B., 1900; Columbia University, A. M., 1903.

William Echard Golden, Teacher in Polytechnic Preparatory School, Brooklyn, N. Y.
Indiana University, A. B., 1888, and A. M., 1890.

Benton Sullivan Monroe. .... Instructor in English, Cornell University
Cornell University, A. B., 1896; A. M., 1897, and Ph. D., 1901.

Clark Sutherland Northup, Assistant Professor of the English Language and Literature, Cornell University
Cornell University, A. B., 1893, and Ph. D., 1898.

Frances Melville Perry..... .....Instructor in English, Wellesley College
Butler College, A. B., 1891, and A. M., 1894.

Ralph Curtis Ringwalt.....Lecturer in Public Speaking, Columbia University
Harvard University, A. B., 1895, and LL. B., 1901.

Martha Hale Shackford.....Instructor in English Literature, Wellesley College
Wellesley College, A. B., 1896; Yale University, Ph. D., 1901.

Ada Laura Snell.....Instructor in English, Mount Holyoke College
Mount Holyoke College, A. B., 1898

FRENCH

Albert Schinz.... .....Associate in French Literature, Bryn Mawr College
University of Neuchâtel, A. B., 1888, and A. M., 1889; University of Tübingen, Ph. D., 1894.

Frank Elbert Brooks, Instructor in French, Teachers College, Columbia University
Cornell University, A. B., 1890.

Harry Egerton Ford, Professor of Romance Languages, Washington and Jefferson College
Toronto University, A. B., 1895, and A. M., 1900.

Louise Holmquist, Instructor in French in the Sachs Collegiate Institute, New York, N. Y.
Vassar College, A. B., 1901.

Cornelia Hephzibah Bulkley Rogers, Associate Professor of Romance Languages, Vassar College
Wellesley College, A. B., 1884; Yale University, Ph. D., 1894.

Louis Alexandre Roux..... Teacher in the Newark Academy, Newark, N. J.
Brown University, A. B., 1894.

GEOGRAPHY

Amadeus William Grabau, Adjunct Professor of Palæontology, Columbia University
Massachusetts Institute of Technology, S. B., 1896; Harvard University, S. M., 1898, and S. D., 1900.

Joseph Moore Jameson.....Teacher in the Pratt Institute, Brooklyn, N. Y.
Cornell University, Ph. B., 1893.

GERMAN

Lawrence A. McLouth, Professor of the German Language and Literature, New York University
University of Michigan, A. B., 1887.

Emilie A. Flintermann.....Instructor in German, Mount Holyoke College
University of Michigan, Ph. B., 1898.

George Maxwell Howe.....Instructor in German, Cornell University
Indiana University, A. B., 1894; Cornell University, Ph. D., 1901.

August Preăn, Teacher of German in Columbia Grammar School, New York, N. Y.
University of Münster, Ph. D., 1883.

Mélanie Constanze Richardt, Teacher of German in the Collegiate School, New York, N. Y.

Rudolf Tombo, Sr. ....Tutor in German, Barnard College
University of Rostock, Ph. D., 1870.

GREEK

William Nickerson Bates..Assistant Professor of Greek, University of Pennsylvania
Harvard University, A. B., 1890, A. M., 1891, and Ph. D., 1893.

Agnes Baldwin..... ...Teacher in the Barnard School for Girls, New York, N. Y.
Barnard College, A. B., 1897; Columbia University, A. M., 1900.

Charles Knapp....Adjunct Professor of Classical Philology, Columbia University
Columbia University, A. B., 1887, A. M., 1888, and Ph. D., 1890.

Grace Harriet Macurdy.....Associate Professor of Greek, Vassar College
Radcliffe College, A. B., 1888; Columbia University, Ph. D., 1903.

HISTORY

Frederick Robertson Jones, Associate in Economics and Politics, Bryn Mawr College
Western Maryland College, A. B., 1892, and A. M., 1894; Johns Hopkins University, Ph. D., 1896.

Elizabeth Briggs, Teacher of History in the Sachs Collegiate Institute, New York, N. Y.
Graduate of Harvard Annex, 1887; Cornell University, A. M., 1891.

Arthur Charles Howland, Instructor in History, Teachers College, Columbia University
Cornell University, A. B., 1893; University of Pennsylvania, Ph. D., 1897.

George Douglas Robins, Teacher in Riverview Military Academy, Poughkeepsie, N. Y.
Wesleyan University, A. B., 1898.

James Thomson Shotwell..... ...Lecturer in History, Columbia University
Toronto University, A. B., 1898; Columbia University, Ph. D., 1903.

LATIN

Nelson Glenn McCrea.....Professor of Latin, Columbia University
Columbia University, A. B., 1885, A. M., 1886, and Ph. D., 1888.

Arthur Alexis Bryant, Instructor in Classics, The Chapin Collegiate School, New York, N. Y.
Harvard University A. B., 1897, and A. M., 1898.

Charles Joseph Deghuée.....Master in the Trinity School, New York, N. Y.
Columbia University, A. B., 1884, A. M., 1885, and L. H. D., 1886.

Susan Fowler .. ....Teacher of Latin in the Brearley School, New York, N. Y.
Bryn Mawr College, A. B., 1895.

Susan Braley Franklin, Teacher of Greek and Latin, Miss Baldwin's School, Bryn Mawr, Pa.
Bryn Mawr College, A. B., 1889, and Ph. D., 1895.

Friedrich Otto Koenig, Teacher of Latin in the Sachs Collegiate Institute, New York, N. Y.
University of Munich, J. U. D., 1887.

Ferris Walton Price.....Professor of Latin, Swarthmore College
Swarthmore College, A. B., 1874, and A. M., 1887.

John Calvin Watson... .....Instructor in Latin, Cornell University
Harvard University, A. B., 1894, A. M., 1900, and Ph. D., 1902.

MATHEMATICS

Frank Nelson Cole.....Professor of Mathematics, Columbia University
Harvard University, A. B., 1882, A. M. and Ph. D., 1886.

Grace Andrews.....Assistant in Mathematics, Barnard College
Wellesley College, B. S., 1890; Columbia University, A. M., 1899, and Ph. D., 1901.

Charles Earl Biklé, Adjunct Professor of Mathematics, Teachers College, Columbia University
Dickinson College, A. B., 1886, and A. M., 1889.

Elsa Bowman.... ....Teacher in the Brearley School, New York, N. Y.
Bryn Mawr College, A. B., 1896.

Hiram Henry Denio, Instructor in Mathematics, Collegiate School, New York, N. Y.
Cornell University, B. S., 1898.

Charles Savage Forbes.....Assistant in Mathematics, Columbia University
Columbia University, A. B., 1901, and A. M., 1903.

John R. Gardner.....Teacher of Mathematics, Irving School, New York, N. Y.
Upper Iowa University, B. S., 1890, and M. S., 1900; State University of Iowa, C. E., 1894.

Edward Kasner..... ....Tutor in Mathematics, Barnard College
College of the City of New York, B. S., 1896; Columbia University, A. M., 1897, and Ph. D., 1899.

Richard Morris.....Instructor in Mathematics and Graphics, Rutgers College
Rutgers College, B. S., 1899, and M. S., 1902.

Helen Sleeper Pearson, Teacher of Mathematics in Miss Baldwin's School, Bryn Mawr, Pa.
Smith College, A. B., 1881, and A. M., 1883.

Roxana H. Vivian..... .....Instructor in Mathematics, Wellesley College
Wellesley College, A. B., 1894; University of Pennsylvania, Ph. D., 1901.

Harry Emmett Webb .... Teacher in the Stevens School, Hoboken, N. J.
University of Rochester, A. B., 1898.

PHYSICS

Arthur Willis Goodspeed, Assistant Professor of Physics, University of Pennsylvania
Harvard University, A. B., 1884; University of Pennsylvania, Ph. D., 1889.

Joseph Moore Jameson.....Teacher in the Pratt Institute, Brooklyn, N. Y.
Cornell University, Ph. B., 1893.

Frank Leo Tufts.....Instructor in Physics, Columbia University
Antioch College, B. S., 1891; Harvard University, A. B., 1894; Columbia University, A. M., 1896, and Ph. D., 1897.

SPANISH

Cornelia Hephzibah Bulkley Rogers, Associate Professor of Romance Languages, Vassar College
Wellesley College, A. B., 1884; Yale University, Ph. D., 1894.

Louis Alexandre Roux.....Teacher in the Newark Academy, Newark, N. J.
Brown University, A. B., 1894.

It will be observed that representatives of the secondary schools were in every group of readers. The total number of answer-books (including laboratory note-books) read once was

14,812, and the total number read by a second reader was 6,215, so that the total number of answer-books read once by a single reader was 21,027.

Under the rules of the Board, every answer-book rated 60 or below must be examined independently by two readers. As a matter of fact, for the purpose of securing uniformity of standards, especially in the earlier stages of the work, many of the books rated above 60 were examined by two or more readers. It may be of interest to mention that the cost per candidate of reading and rating the answer-books has increased each year since the work of the Board began. In 1900 the cost per candidate was 95 cents, in 1902 it was $1.37, while this year it was $1.53. This increase is to be explained to some extent by the fact that there has been an increase in the average number of answer-books submitted by the candidates, but is due chiefly to the increase in the number of readers from a distance whose traveling and other necessary expenses are defrayed by the Board.

The following table gives statistics in regard to the number of answer-books read in each subject:

TABLE VII

Subject	Number of Answer-Books Received	Number of Answer-Books Read a Second Time	Total	Number of Hours Spent in Reading	Average Number of Answer-Books Read per Hour
Botany	9	9	18	12	2.8
Laboratory books	8	8	16		
Chemistry	226	79	305	77½	7.9
Laboratory books	225	79	304		
Drawing	155	47	202	20	10
English	1857	510	2367	238	10
French	955	476	1431	223	6.4
Geography	18	18	36	14	4.9
Laboratory books	16	16	32		
German	964	308	1272	178	7.1
Greek	1006	354	1360	97½	13.9
History	1068	504	1572	288	5.5
Latin	3860	1953	5813	290	20
Mathematics	3860	1635	5495	482½	11.4
Physics	295	101	396	57½	13.4
Laboratory books	273	101	374		
Spanish	17	17	34	6	5.7
	14,812	6215	21,027	1984	10.6

On account of the large increase in the number of answer-books submitted by the candidates, it was not possible for the readers to complete their work at as early a date as in previous years. The first installment of certificates was mailed to the candidates on June 30, and the last installment, with the exception of course of the certificates of candidates examined in Hawaii, in Europe, and in South America, was mailed on July 3.

A few reports forwarded to candidates required revision. Some of the candidates at one or more of the examinations wrote their examination numbers incorrectly, or omitted them altogether, while other candidates were dilatory in submitting their laboratory notebooks or submitted notebooks which were not provided with the required teacher's certificate. In every such case, where it was possible to rectify the error of the candidate, a revised certificate was issued.

In this connection it is very gratifying to observe that, in addition to its strictly academic functions, the Board is exerting in another way an important educational, or, perhaps we should say, disciplinary influence. This is to be seen in the increasing intelligence and accuracy with which the candidates comply with the requirements of the Board. Not only were the various blank forms filed by the candidates of this year filled out in a more satisfactory manner than last year, but the total number of errors made by the candidates in writing their examination numbers, in preparing their laboratory notebooks, and in other similar ways, was notably less than in the past.

Results of the Examinations

The following table, which shows the results of the examinations, is of considerable interest when taken in connection with the similar tables published in previous reports:

TABLE VIII

	Number of Candidates	Ratings 90–100 %	Ratings 75–89 %	Ratings 60–74 %	Ratings 50–59 %	Ratings 40–49 %	Ratings 0–39 %	Ratings 60–100 %	Ratings 50–100 %	Ratings 40–100 %
English										
a. Reading	996	3.8	36.2	34.3	6.6	9.2	9.8	74.4	81.0	90.2
b. Study	861	5.2	28.3	36.8	9.4	9.8	10.5	70.4	79.8	89.6
	1857	*4.5*	*32.6*	*35.5*	*7.9*	*9.4*	*10.1*	*72.5*	*80.4*	*89.9*
History										
a. Ancient	172	9.3	20.4	35.5	9.9	15.1	9.9	65.1	75.0	90.1
b. Mediæval and Modern	59	1.7	23.7	20.3	13.6	13.6	27.1	45.8	59.3	72.9
c. English	345	1.1	12.2	38.3	22.6	12.5	13.3	51.6	74.2	86.7
d. American	408	2.9	13.0	35.3	18.6	13.0	17.2	51.2	69.9	82.8
Greek	43	4.6	11.6	20.9	16.3	25.6	20.9	37.2	53.5	79.1
Roman	41	4.8	9.7	39.1	7.3	26.8	12.2	53.6	61.0	87.8
	1068	*3.5*	*14.3*	*35.0*	*17.7*	*14.2*	*15.2*	*53.2*	*70.5*	*84.7*
Latin										
a. i. Grammar	698	1.1	7.0	19.9	18.3	21.9	31.7	28.1	46.4	68.3
ii. Composition	706	5.2	12.0	26.1	11.2	11.1	34.4	43.3	54.5	65.5
b. Cæsar	414	4.1	22.9	34.3	15.7	8.2	14.7	61.4	77.1	85.3
c. Cicero	640	2.5	26.1	45.2	12.2	6.4	7.6	73.7	86.0	92.3
d. Virgil, Æneid, I–VI	430	5.1	29.8	32.1	7.9	11.6	13.5	67.0	74.9	86.5
e. Nepos	19	5.2	21.1	21.1	—	26.3	26.3	57.4	57.4	73.7
f. Sallust	12	—	50.0	8.3	25.0	16.7	—	58.3	83.3	100.0
g. Ovid	23	4.3	30.4	39.1	4.3	13.1	8.7	73.9	78.3	91.3
h. Virgil, Ecl. and Georg.	2	—	50.0	50.0	—	—	—	100.0	100.0	100.0
i. Virgil, Æneid, VII–XII	—	—	—	—	—	—	—	—	—	—
k. Cicero, Am. and Sen.	1	—	—	—	—	100.0	—	—	—	100.0
l. Advanced Composition	399	1.5	4.8	23.6	9.8	12.8	47.6	29.8	39.6	52.4
m. Sight Translation	516	6.9	14.0	25.1	12.8	10.3	31.0	46.0	58.7	69.0
	3860	*3.9*	*16.4*	*29.3*	*12.7*	*12.2*	*25.6*	*49.4*	*62.2*	*74.5*
Greek										
a. i. Grammar	209	5.3	22.5	33.0	4.8	10.1	24.4	60.8	65.6	75.5
ii. Composition	202	11.4	30.7	18.3	6.4	5.4	27.7	60.4	66.8	72.4
b. Xenophon	203	5.9	35.5	34.0	6.9	3.4	14.3	75.4	82.3	85.7
c. Homer, Iliad, I–III	121	3.3	34.7	37.2	6.6	4.9	13.2	75.2	81.8	86.8
d. Homer, Iliad, VI–VIII	1	—	100.0	—	—	—	—	100.0	100.0	100.0
e. Herodotus	—	—	—	—	—	—	—	—	—	—
f. Advanced Composition	109	7.3	4.6	33.0	18.3	9.2	27.5	45.0	63.3	72.5
g. Sight Translation	161	7.4	24.8	35.4	8.1	5.6	18.6	67.7	75.8	81.4
	1006	*7.0*	*20.7*	*31.1*	*7.8*	*6.4*	*21.0*	*64.8*	*72.6*	*78.9*
French										
a. Elementary	625	1.8	20.1	37.9	14.5	11.4	14.3	59.8	74.3	85.7
b. Intermediate	279	.4	6.9	29.0	14.1	18.1	31.5	36.2	50.4	68.5
c. Advanced	58	—	—	12.3	22.8	10.5	54.4	12.3	45.0	45.6
	962	*1.3*	*15.0*	*33.8*	*14.9*	*13.3*	*21.7*	*50.2*	*65.0*	*78.3*
German										
a. Elementary	632	8.1	27.1	33.2	10.4	7.9	13.3	68.4	78.8	86.7
b. Intermediate	266	3.4	21.4	43.6	12.0	7.5	12.0	68.4	80.5	88.0
c. Advanced	66	10.6	22.7	30.3	6.1	10.6	19.7	63.6	69.7	80.3
	964	*6.9*	*25.2*	*35.9*	*10.6*	*8.0*	*13.4*	*68.1*	*78.6*	*86.6*
Spanish	15	6.7	13.3	40.0	6.7	13.3	20.0	60.0	66.7	80.0
Mathematics										
a. Elementary										
i. To Quadratics	973	20.1	17.4	31.2	11.1	10.7	9.5	68.8	79.9	90.6
ii. Quadratics, etc.	887	7.9	14.1	26.2	13.0	13.4	25.5	48.1	61.1	74.5
iii. Progressions, etc.	401	4.5	12.0	17.7	12.5	11.5	41.9	34.2	46.6	58.1
b. Advanced Algebra										
i. Series	63	1.6	6.3	27.0	6.3	19.0	39.7	35.0	41.3	60.4
ii. Theory of Equations	44	4.6	9.1	18.2	4.6	9.1	54.5	31.8	36.4	45.5
c. Plane Geometry	927	11.3	22.5	31.7	10.9	11.2	12.3	65.6	76.5	87.7
d. Solid Geometry	291	19.0	23.0	30.3	6.5	8.6	12.7	72.2	78.7	87.3
e. Trigonometry										
i. Plane	223	5.4	14.4	30.0	18.4	15.3	16.6	49.8	68.2	83.4
ii. Spherical	51	5.9	17.7	29.4	13.7	5.9	27.4	53.0	66.7	72.6
	3860	*12.0*	*17.3*	*28.4*	*11.6*	*11.7*	*19.1*	*57.6*	*69.3*	*81.0*
Physics	273	4.0	22.3	44.7	11.4	10.6	7.0	71.1	82.4	93.0
Chemistry	219	3.6	25.1	35.2	18.7	13.2	4.1	63.9	82.6	95.9
Botany	8	—	12.5	50.0	25.0	—	12.5	62.5	87.5	87.5
Geography	16	6.2	25.0	43.7	18.7	—	6.2	75.0	93.7	93.7
Drawing	155	3.2	9.7	56.8	5.2	5.2	20.0	69.7	74.8	80.0
	4203	*6.3*	*20.0*	*31.9*	*11.8*	*11.1*	*18.9*	*58.2*	*70.0*	*81.1*

The average number of ratings per candidate this year is 8.8, as against 8.6 last year, and 8.1 in 1901. The examinations appear, on the whole, to have been somewhat easier than those of last year. Fifty-eight per cent. of the ratings assigned were 60 or above, as against fifty-six per cent. last year, and fifty-nine per cent. in 1901.

The following table institutes a comparison between the results of the three years:

TABLE IX

Ratings	1901	1902	1903
90–100	7.1 per cent.	6.7 per cent.	6.3 per cent.
75–89	20.2	17.8	20.0
60–74	32.0	31.4	31.9
50–59	11.2	12.4	11.8
40–49	11.7	12.4	11.1
0–39	17.8	19.4	18.9

Financial

At the meeting of the Board held November 8, 1902, a resolution was adopted inviting the attention of those colleges and scientific schools that had joined the Board since the meeting of May 8, 1901, to the action taken by the Board on that day, whereby for the purpose of providing a working capital each co-operating college was asked to advance the sum of $300, $225, or $150, as determined by the size of its freshman class. It was thought that the institutions more recently admitted to the Board might, in view of the deficiency incurred thru operations of 1902, be willing to make advances in the same manner as had been done by the institutions that originally belonged to the Board. In response to this resolution advances were made as indicated below:

1. Massachusetts Institute of Technology, Wellesley College, $300 each.. $600
2. Mount Holyoke College..... 225
3. Adelphi College, Case School of Applied Science, Colgate University, University of Rochester, $150 each..... 600

$1425

Bucknell University and Syracuse University have not yet made advances to the Board.

By vote of the Board on November 8, 1902, the sum of $9000 was appropriated for the expenses of the current fiscal

year. The operations of the Board from December 1, 1902, to September 1, 1903, have involved an expenditure of $8256.31. The estimated expenditures for the remainder of the fiscal year, that is, up to December 1, 1903, are $715, making a total of $8971.31.

The revenues of the Board, up to September 1, amount to $8771.97. During the last three months of the fiscal year they will be increased by the sales of printed documents and duplicate certificates, and also thru the amount to be received from Ginn & Co., on account of the first two volumes of examination questions. Estimating these additional revenues at $150, there will be a total income of $8921.97, leaving a deficit on the operations of the current year of less than $100, as against a deficit last year of over $900.

There can be no doubt whatsoever but that, if the work of the Board next year is conducted on the same conservative and economical basis as during the present year, there will result a small surplus to be applied toward the payment of the Board's indebtedness. This indebtedness at present amounts to $8225, of which $3500 was advanced during the first year of the Board's existence by a friend interested in its work, and the remainder has been advanced by the co-operating colleges.

Statement of Income and Expenditures

For the purpose of record, the receipts and expenditures during the fiscal year ending November 30, 1902, are given in the following financial statement, which differs from that given in the last annual report only by including the transactions from September 1 to November 30, 1902.

TABLE X

FINANCIAL STATEMENT, DECEMBER 1, 1901, TO NOVEMBER 30, 1902

RECEIPTS

	Balance on hand, December 1, 1901	$2916.57
1.	Advances by co-operating colleges	300.00
2.	Sales of volumes of examination questions	107.52
3.	Sales of documents	67.55
4.	Contributions towards expenses of examinations held abroad	35.00
5.	Examination fees	6750.00
		$10,176.64

EXPENDITURES

A. Office of the secretary:		
1. Salaries	$1960.00	
2. Printing	700.95	
3. Stationery and incidentals	163.99	
4. Postage and expressage	191.28	
5. Clerical and other assistance	290.37	
		$3306.59
B. Conduct of examinations:		
1. Examiners	$1188.92	
2. Readers	1873.44	
3. Proctors and supervisors	459.82	
4. Examination supplies	690.47	
5. Postage and expressage	345.81	
		$4558.46
Total expenses	$7865.05	
Balance on hand, November 30, 1902	2311.59	
		$10,176.64

It may be of interest to compare the items in the preceding statement with those in the following statement, which gives the receipts and expenses during the current fiscal year to September 1, 1903.

TABLE XI

FINANCIAL STATEMENT, DECEMBER 1, 1902, TO AUGUST 31, 1903

RECEIPTS

Balance on hand, December 1, 1902	$2311.59
1. Advances by co-operating colleges	1275.00
2. Sales of volumes of examination questions	31.87
3. Sales of printed documents	33.10
4. Sales of duplicate certificates	46.00
5. Examination fees	8586.00
6. Contribution of Columbia University toward expense of conducting examinations in June, 1903	75.00
Total	$12,358.56

EXPENDITURES

A. Office of the secretary:		
1. Salaries	$1510.00	
2. Printing	566.45	
3. Stationery and incidentals	119.15	
4. Postage and expressage	256.65	
5. Clerical and other assistance	582.95	
		$3035.20

B. Conduct of examinations:			
1. Examiners			
Salaries	$955.00		
Expenses	248.91		
		$1203.91	
2. Readers			
Salaries	$1975.00		
Expenses	494.96		
		$2469.96	
3. Supervisors and proctors			
Expenses		566.31	
4. Examination supplies			
Question papers, answer-books, logarithmic tables, maps, envelopes, etc.		763.82	
5. Postage and expressage		217.11	
			$5221.11
Total expenses			$8256.31
Balance on hand, September 1, 1903			4102.25
			$12,358.56

The estimated expenses for the remainder (three months) of the fiscal year are:

Salaries	$495.00	
Printing annual report	65.00	
Document No. 15	50.00	
Binding of records	40.00	
Stationery and incidentals	25.00	
Postage and expressage	40.00	
		$715 00

Policy of the Board

After the close of the examinations, the secretary received a large number of letters from candidates and their teachers, asking that allowance be made for special conditions under which the examinations had been taken.

Several candidates who had been prepared in foreign countries desired that some allowance be made for their imperfect English. A number of candidates whose examination in algebra had been disturbed by an entirely unforeseen and very annoying occurrence, requested that their work in that subject be regarded with leniency. Other candidates who had taken examinations in several parts of a single subject, as, for example, Latin, or Greek, asked that the resulting ratings be averaged, in

order to eliminate the effect of a single low rating that, in their opinion and in the opinion of their teachers, was largely accidental. To all such communications the secretary replied that the College Entrance Examination Board acts simply as a machine for registering the results of the examinations, and that the interpretation and adjustment of these results is, under the constitution of the Board, expressly reserved to the individual institutions accepting the examinations. The secretary wishes to take advantage of this opportunity again this year, to urge upon the individual institutions the desirability of interpreting with at least some liberality the results of the examinations. To him it seems eminently fair that the ratings obtained by a candidate in several parts of the same subject should be averaged for the purpose of obtaining a single rating for the subject as a whole. Experience seems to show that under every system of examination, however carefully it may be planned, there will be accidental variations that in some way ought to be removed.

In some quarters the idea appears to be entertained that the influence of the College Entrance Examination Board is necessarily against the certificate system of admission to college. That this idea is quite without justification is shown by the fact that three-quarters of the institutions to which admission was sought by the candidates taking this year's examinations were institutions that have adopted the certificate system. Upon consideration it will be admitted, I think, that no institution can successfully administer the certificate system without an examination system auxiliary to it. It will constantly happen that for some reason the institution must refuse to admit upon certificate certain individual candidates, possibly the candidates from a particular school, or a particular community. In every such case the institution should be in a position to offer to these candidates properly conducted examinations, at which recognized standards are observed. It follows that the examinations of the Board possess an extraordinary value for institutions most of whose students are admitted upon certificate.

In the same way the smaller colleges that have no large body

of alumni thruout the country, and cannot hope to maintain well-organized examinations at a distance, are finding that the examinations of the Board afford them an almost indispensable auxiliary.

The Board has not yet seen its way to make the administrative changes, referred to in the second annual report of the secretary, that are necessary before the examinations can be used on a large scale for the purpose of graduating students from the public high schools. It will be of interest, however, to mention the fact that a considerable number of private schools have already adopted the examinations as a basis for graduation. Several schools to which certain colleges have given the privilege of certification have decided to give certificates only to pupils that take the examinations of the Board.

The two great desiderata in the work of the secondary schools thruout the country are: first, that thoroness shall supersede diffuseness; secondly, that there shall be uniformity of educational standards. To secure these two great ends, no means can be more effective than a widespread uniform system of examinations for admission to college. In those parts of the country where the examination system has been practically discontinued, quite as much, or perhaps even more than in those parts where several diverse examination systems prevail, the need of generally recognized standards of scholarship is felt. A number of important Western colleges and universities have already thought it wise to recommend that at least a part of their candidates should take the examinations of the Board.

Respectfully submitted,

THOMAS S. FISKE, *Secretary*

September 1, 1903

VII

REPORT OF THE COMMITTEE OF THE AMERICAN MATHEMATICAL SOCIETY ON DEFINITIONS OF COLLEGE ENTRANCE REQUIREMENTS IN MATHEMATICS

At the summer meeting of the American Mathematical Society in September, 1902, a special committee was appointed to prepare standard formulations of college entrance requirements in mathematics, in co-operation with committees already appointed by the Society for the Promotion of Engineering Education and the National Educational Association. The following report has been prepared by the committee of the Mathematical Society, taking due account, on the one hand, of previous work along similar lines, as represented for example in the mathematical definitions of the College Entrance Examination Board and the Commission of Colleges in New England, and, on the other hand, of existing conditions in the mathematical instruction of colleges and schools.

The membership of the committee represents various forms of higher education only, but advice of value has been sought and obtained from other members of the Mathematical Society and from secondary teachers.

In its selection of topics the committee has aimed to emphasize fundamental matters of principle, and to omit complicated processes and subjects not capable of rigorous treatment in the secondary school.

By the selection of subjects it is not implied that all should be required by any one college, or be taught in any one school.

Report

The committee understands its duties in the following sense:

First: To specify those mathematical subjects which are generally recognized as appropriate requirements for admission to colleges and scientific schools.

Second: To specify details under these subjects in such a manner as to represent the standards of the best secondary

instruction—the word " best " being interpreted in a qualitative rather than a quantitative sense.

Third: The committee understands also that the consideration of pedagogic questions is not primarily among its duties.[1] It has therefore made no attempt to deal with methods of secondary education in mathematics, or the order of taking up the subjects and their correlation with each other and with other sciences. The order in which the subjects and the topics under them are presented below does not necessarily imply preference of the committee as to order of teaching either the subjects or the topics. It is the opinion of the committee that these are the subjects and the topics which, according to the best present usage, should be offered for admission to colleges and scientific schools.

The formulation is not to be interpreted as exhaustive. It represents rather the extent to which, in the opinion of the committee, definite specification should be undertaken by it; it is expected that further details will be determined in accordance with the judgment of the particular college, school, or teacher.

The definitions proposed are based on present usage and standards. In case of divergence between standard text-books and what seemed a more scientific presentation of the subject in question, the committee has endeavored to make a choice which should not depart so far from current usage as to involve hardship to schools or teachers. The committee is of opinion that no formulation should be considered as having more than temporary validity. No advantages attendant upon uniformity of definition could counterbalance any tendency of the definitions to retard progress of secondary education in mathematics. It is therefore recommended that if the definitions are approved, they be revised at intervals, perhaps of ten years.

SUBJECTS

1. Elementary Algebra.
2. Plane Geometry.
3. Solid Geometry.
4. Trigonometry.
5. Advanced Algebra.

[1] Reference may be made to the important work of recently formed societies for the improvement of mathematical teaching.

DEFINITIONS

1. *Elementary Algebra*

The four fundamental operations for rational algebraic expressions.

Factoring, determination of highest common factor and lowest common multiple by factoring.

Fractions; including complex fractions, ratio and proportion.

Linear equations, both numerical and literal, containing one or more unknown quantities.

Problems depending on linear equations.

Radicals, including the extraction of the square root of polynomials and of numbers.

Exponents, including the fractional and negative.

Quadratic equations, both numerical and literal.

Simple cases of equations with one or more unknown quantities, that can be solved by the methods of linear or quadratic equations.

Problems depending on quadratic equations.

The binomial theorem for positive integral exponents.

The formulas for the nth term and the sum of the terms of arithmetic and geometric progressions, with applications.

It is assumed that pupils will be required thruout the course to solve numerous problems which involve putting questions into equations. Some of these problems should be chosen from mensuration, from physics, and from commercial life. The use of graphical methods and illustrations, particularly in connection with the solution of equations, is also expected.

2. *Plane Geometry*

The usual theorems and constructions of good text-books, including the general properties of plane rectilinear figures; the circle and the measurement of angles; similar polygons; areas; regular polygons and the measurement of the circle.

The solution of numerous original exercises, including loci problems.

Applications to the mensuration of lines and plane surfaces.

3. *Solid Geometry*

The usual theorems and constructions of good text-books, including the relations of planes and lines in space; the prop-

erties and measurement of prisms, pyramids, cylinders, and cones; the sphere and the spherical triangle.

The solution of numerous original exercises, including loci problems.

Applications to the mensuration of surfaces and solids.

4. *Trigonometry*

Definitions and relations of the six trigonometric functions as ratios; circular measurement of angles.

Proofs of principal formulas, in particular for the sine, cosine, and tangent of the sum and the difference of two angles, of the double angle and the half angle, the product expressions for the sum or the difference of two sines or of two cosines, etc.; the transformation of trigonometric expressions by means of these formulas.

Solution of trigonometric equations of a simple character.

Theory and use of logarithms (without the introduction of work involving infinite series).

The solution of right and oblique triangles, and practical applications, including the solution of right spherical triangles.

5. *Advanced Algebra*

Permutations and combinations, limited to simple cases.

Complex numbers, with graphical representation of sums and differences.

Determinants, chiefly of the second, third, and fourth orders, including the use of minors and the solution of linear equations.

Numerical equations of higher degree, and so much of the theory of equations, with graphical methods, as is necessary for their treatment, including Descartes's rule of signs and Horner's method, but not Sturm's functions or multiple roots.

H. W. TYLER, *Chairman*,
Massachusetts Institute of Technology
T. S. FISKE,
Columbia University.
W. F. OSGOOD,
Harvard University.
ALEXANDER ZIWET,
University of Michigan.
J. W. A. YOUNG,
University of Chicago.
Committee.

VIII

REVIEWS

An introduction to the history of western Europe—By JAMES HARVEY ROBINSON, Professor of History in Columbia University. Boston: Ginn & Co., 1903. x+714 p. $1.50.

A history of Modern Europe—By MERRICK WHITCOMB, Professor of History in University of Cincinnati. New York: D. Appleton & Co., 1903. xii+361 p. $1.00.

A satisfactory text-book must be the result of a combination in the writer of two essential elements. First, the book must give evidence that the author has sufficient scholarship to impart to his readers the most important facts of the subject with which he is dealing; second, it must show that he has sufficient ability to present his material in a form that will be easily intelligible to the readers for whom the book is intended.

Both the books before us are presumably intended primarily for use in secondary schools, and both may, therefore, fairly be judged from the point of view of the secondary-school teacher.

Of the scholarship displayed in Professor Robinson's book nothing but the highest words of praise can be said. Almost every page of the book is replete with evidences of the author's ability to select and present to the reader the facts of most worth in the history of western Europe. The farther one reads in the book, the more he becomes impressed with the author's mastery of his subject. Thus, for instance, in some three or four chapters of ten or fifteen pages each, the subject of the mediæval Church is presented in such a way that but very little that might have been said is left out. In another three or four chapters, we have laid before us the causes and the result of the Protestant revolution in an equally skillful way. Nowhere else, in an equal number of pages, can one find such a sane, such a scholarly treatment of the French revolution. All in all, it is safe to say that no manual covering the same period of history has yet appeared which even

remotely equals this book in scholarship and in breadth of attainments.

In form and construction, too, the book is worthy of high praise. Numerous well-selected, well-executed maps have been inserted which really serve to elucidate the text. Here are no stock maps crowded with hundreds of irrelevant names and introduced without any regard to their appropriateness. The illustrations, too, are especially to be commended for their appropriateness and their exceptionally fine execution. One could wish, however, that a few more small illustrations had been introduced to relieve the pages somewhat of their heavy appearance.

To this end, too, Professor Robinson might have contributed by the more frequent use of short paragraphs. As it is, the book often runs for page after page without any illustrations and with only two or three paragraphs to the page—a circumstance which will make it exceedingly difficult for the young student.

Finally, in spite of its exceptional display of scholarship, one cannot help feeling that the book will not prove entirely successful as a secondary-school manual. Professor Robinson's treatment of the Church, for instance, admirable as it is, is scarcely fitted to the minds of pupils of fifteen or sixteen, who are approaching the subject for the first time, and what is true of the Church is equally true of many other parts of the book.

As a college manual, the book will no doubt prove to be the best work that has so far appeared; as a text-book for secondary schools it is open to the objection that it is probably over the head of the average pupil.

In criticising Professor Whitcomb's book much that has been said in commendation of Professor Robinson might be repeated. Here, too, is a book which shows that the author is master of the subject about which he is writing.

On the other hand, Whitcomb's work is open to grave criticism for several serious faults in construction. In the first place, one may question the wisdom of devoting over two-thirds of the entire book to the history of the nineteenth century. A comprehension of the history of the past century is,

of course, immensely important to the student, but in any elementary book like this, a general view, with equal emphasis laid upon the history of all centuries, is apt to accomplish more good than such a treatment as Professor Whitcomb has here given us. As a result of his over-emphasis of the nineteenth century, many things that should have been told are altogether slighted; thus, for instance, not a word is said about England in the eighteenth century; many things which should have been deeply impressed upon the pupil's mind are passed over with the barest mention.

In the second place, the book contains altogether too few maps, a fault not lightly to be forgiven. The illustrations, too, are by no means well chosen or appropriately inserted in the book. Why, for instance, should a three-quarter page illustration of the Paris Exposition of 1867 be inserted into a book in which not a word is said about the exposition in the text? Why should a full-page picture of Queen Victoria be introduced into a chapter on Switzerland, almost ten pages from the author's chapter on the history of England?

The text also suffers from a too elaborate system of subdivision—as the book is now constructed, the pupil will almost inevitably fail to grasp the essential unity of the period of history about which the author has written.

Finally, there cannot but be grave doubt as to the value of Professor Whitcomb's so-called Source Reviews. In the first place, it is a rather curious nomenclature which includes, under source reviews, extracts from Morse, Stephens, Carlyle, Motley, and Macaulay. In the second place, many of the extracts, especially in the earlier part of the book, are far beyond the comprehension of the pupils who are supposed to use them.

All in all, Professor Whitcomb's book, tho its style makes it more easily comprehensible to young readers, can scarcely be ranked in the same class with that of Professor Robinson.

ARTHUR M. WOLFSON

DE WITT CLINTON HIGH SCHOOL,
NEW YORK CITY

The Short story—By HENRY SEIDEL CANBY. New York: Henry Holt & Co., 1902. 30 p. 30 cents.

A Study of prose fiction—By BLISS PERRY. Boston: Houghton, Mifflin & Co., 1902. ix+406 p. $1.25.

The Writing of the short story—By LEWIS WORTHINGTON SMITH. Boston: D. C. Heath & Co., 1902. ii+36 p. 25 cents.

Students and teachers of rhetoric and literature are to be congratulated on the appearance of these volumes. Each of the three serves a distinct purpose, tho, perhaps, not in the same degree as the rest. Each one either adds something to our knowledge of the subject or in a measure facilitates our study of it. All are, therefore, useful publications.

The "literature" of the short story has in the last few years been considerably augmented. It is not so very long since Mr. Charles Raymond Barrett wrote, "There is no modern literary form which is so little understood as is the short story."[1] That would probably not be true to-day. We now have the results of much careful study of the subject. In our high schools and colleges instruction in the writing of narratives is more efficient than formerly. And while it is true that many poor stories somehow slip into print, still the number of good short stories annually turned out was never larger than it is to-day.

Mr. Canby, in the monograph before us, successfully expounds the difference between the short story and the mere tale or short narrative; a difference which some would have us believe as great, almost, as the difference between prose and poetry. The short story is characterized, he finds, "by a very scientific adaptation of means to end, which end may be called vividness, and by a structure which, in its nice proportions and potentiality for adequate expression, is a more excellent instrument than anything the old tale can show." The short story, moreover, has its source in impressions, and aims to convey those impressions as well as to tell a story. Mr. Canby also has something to say about the source of the English short story. In discussing the relations between Hawthorne and the German Romanticists he is properly conservative, holding with Schönbach that it is highly improbable that Hawthorne borrowed anything from the Germans, and

[1] *Short story writing*. New York: 1900. 15 p.

that he rather breathed, in a sense, the same "indefinite element of romanticism" which permeated the air of the period. Mr. Canby further shows the error of Mr. Walter Morris Hart (in *Hawthorne and the short story*) in supposing that a purpose ulterior to the narrative (namely, explanation) characterizes the modern short story, and that the latter may, therefore be traced to the periodical essay of the *Spectator* type. The *Spectator* narrative appealed largely to the intellect; the aim of the short story is "to make the reader feel that with which the writer was impressed."

Mr. Smith's small manual is intended as a text-book. His point of view is that of the psychologist; he has undertaken to study psychologically and minutely classify the means by which the short-story writer conveys the facts of his narrative and his impression. But while this is a good book for the teacher to work thru, we doubt the propriety of inflicting so much theory upon the Freshman, who had usually had no general training in psychology, and who would probably be as much appalled by Mr. Smith's algebraic symbols as the young phonetician is by some of the glossic alphabets.

Mr. Perry's book is based upon a course of lectures on prose fiction delivered before the students of Princeton University. It was, perhaps, hardly necessary for Mr. Perry to remind us of the facts in his career which give his words added weight. Alluding to the fact that he wrote fiction before lecturing upon it, and that his "academic point of view has in turn been modified by the impressions gained during his editorship of *The Atlantic monthly*," he adds: "It is as if an enthusiast for art, after serving first as painter's apprentice and then as lecturer on painting, had been forced to act as hanging committee for an exhibition, and now, with a zeal for his subject which survives every disillusionment, were to mount a chair in the picture gallery and preach to all comers!"

The author proceeds to offer the excuse for his sermonizing that he cannot help it; we may say frankly that he must have learned his homiletics in a good school, for his preaching is anything but disagreeable or dry.

Mr. Perry begins by indicating the methods and the value of the study of fiction. Then he points out in succession the

relation between prose fiction and poetry, between fiction and the drama, and between fiction and science. His chapter on the last is especially interesting. The scientific movement, he finds, has broadened the range of the subject-matter of fiction; has trained the eye and the ear of artist and public alike; has helped men to realize "the dignity and beauty of the human body"; and thru a better understanding of mental processes "has given to the work of some writers a firmness and precision of analysis and phrase which would otherwise be impossible." On the other hand, some disadvantages resulting from the scientific movement are pointed out: the confusion of the distinction between science and art; the narrowing of the sphere accorded to the imagination; a materialistic tendency, which has frequently resulted in grossness; a mechanical psychology. On the whole, the gains and the losses to fiction from contact with science seem to Mr. Perry to be "rather evenly balanced."

Having disposed of these more general matters, our author discusses the characters, the plot, the setting; then the writer of the story. The writer must have an artistic aim; the reader, a sympathetic perception of this aim. The chapters on realism and romanticism, which follow, are decidedly illuminating. Never, we believe, have these matters been set forth more clearly or impartially. The ideal future novelist Mr. Perry would call a realist; but the name matters little. The future novelist "shall see *and* feel *and* think . . . . shall make us see and feel and think, so that when we read his book it may be with the joy of deeper insight and quicker sympathy and a new hold on truth. Truth shall be the keyword of his art, and the truth that he reveals shall be seen of us as beauty." Here is an idealism truly inspiring.

On the short story Mr. Perry reprints his article in *The Atlantic* for August, 1902. His treatment, while not so exhaustive of certain aspects as that of Mr. Canby, is, perhaps, more useful to the student or the novice than either of the two others considered above.

The book concludes with a discussion of "Present tendencies of American fiction." The three to which he draws attention are: the presentation of distinctively American types

and scenes, the excellence of American fiction in a comparatively limited field, and its fundamental good morality and optimism. And for a number of reasons Mr. Perry is himself an optimist. He is not afraid of the approach of the era of democracy, for there is always the divine element in the average man, which novelists have already recognized, tho imperfectly. And of the ultimate triumph of the things of the spirit in America—and hence of the increasing excellence of the products of the art of fiction—he is sublimely sure.

The book is well adapted to the needs of the college student and of the general reader—neither of whom will find a dull page. A useful appendix contains numerous suggestions and topics for study, bibliographical notes, and searching review questions.

CLARK SUTHERLAND NORTHUP

CORNELL UNIVERSITY

Brief Greek Syntax—By LOUIS BEVIER, Jr., Ph. D., Professor of the Greek Language and Literature in Rutgers College. New York: American Book Company, 1903. 108 p. 90 cents.

Such volumes of this series as have already appeared are exceedingly attractive. In this volume there is much to commend. In general, the rules of syntax are clearly and tersely expressed. Exception might be taken to the statements of sections 245 and 271. The mixed construction after verbs of hoping, and the like (245), hardly belongs under indirect discourse; at least, some explanation as to the negative here employed should be found. It is, moreover, unfortunate that there is no statement as to the negative used with the indirect discourse infinitive, and that no negative sentence is here given. In section 271 the statement about the purpose participle is a mere repetition of earlier unsatisfactory rules. Not to be commended is the omission of an index, a part quite useful even in a book of this character.

But the chief matter for consideration is the purpose of the book. According to the author, the aim of the book is to emphasize the importance of grammar in the preparatory study of Greek, and to aid in bringing about a reaction against the use of the "natural method" and against "sight

reading," which have resulted "in giving us freshmen whose knowledge of Greek syntax is vague and general rather than clear and precise." That syntax is important, and that freshmen are sadly deficient in it, cannot be denied, but that this deficiency is the result of sight-reading is improbable. Teachers have been confronted with this condition in the past. The remedy is not to make further inroads upon the pupil's time by requiring the use of an extra book, and familiarity with diverse statements and new arrangement of rules already studied. The problem is to be solved rather by economy and elimination, that is, by confinement to one book and exclusion of a considerable portion of the lessons in the elementary books. A beginner's book of 75 to 100 lessons, with references to a cumbrous grammar, deserves no place in the preparatory school of to-day. The universities have demonstrated that preparatory Greek can be taught in one short year, and this has been done by a process of exclusion. The imposition upon the pupil of a syntax, in addition to a grammar, seems unnecessary and even ill-advised.

JAMES D. ROGERS

COLUMBIA UNIVERSITY

Genetic Psychology for Teachers—By CHARLES HUBBARD JUDD, Ph. D. International Educational Series. New York: D. Appleton & Co. 1903. Pp. xiii + 329. $1.50.

Every serious effort made to adapt the wonderfully suggestive conception of "development" to the life of man is welcomed by teachers. The volume under review offers vigorous, optimistic, and at time independent discussion of those aspects of mental development which are more immediately involved in primary education. The "outline"-bred teacher will be much disappointed—and beneficially—in the book, because its ten chapters, or lectures, as they may well be called, do not follow the stereotyped methods of exposition in psychology. Sensation, idea, affection, and activity receive constructive treatment, but they are not made the apperceiving terms.

The first five chapters present various expositions of the idea of development, of which the author is an ardent devotee. The last five chapters seek to apply the principles of develop-

ment to the specific work in elementary education, with occasional references to the entire field of the school. The book is unique in that it regards the conclusions of experimental psychology as unsatisfactory until they are interpreted in light of the idea of development. In these days of rapid reconstruction in educational theory, such a view is valuable in bringing us nearer the possession of true experimental dialectics.

The leading ideas of the book are drawn from psychology, both experimental and analytic, biology, history of education, and schoolroom practices. Only a few of them can be mentioned. The developed consciousness of the teacher is made the point of departure for both analysis and interpretation of results. Child-study is critically replaced by "teacher-study." "The science of teacher-study" demands that "the teacher must be able to understand in detail, first, his own mental characteristics, and secondly, the specific characteristics in which the child differs from himself" (p. 4, 5). Education is defined as the process of consolidating multiple impressions and experiences into "meanings." The origin of most educational ideals is traced to tradition; and it is held that they stand in need of exhaustive rational examination and revision —in light of the principles of development. Individuality, environment, variation, adaptation, and activity are presented as the ascending steps in the process of development. The book then proceeds to treat of the organization of specific habits, and to show how we write, read, and use numbers, as proceeds of organized movement—most space being given to writing. A few educational miscellanea round out the area of educational activities and interests from primary to university education.

The critical reader will be interested to know why the modern exploitation of the child for the sake of a completer science of man, and a saner practice in our schools is replaced by "the science of teacher-study." The author gives his answer tardily (p. 294, 302). However, "teacher-study" is presented as tho the psychology of the teacher is radically different from ordinary adult psychology, and as tho the method of introspection with teacher-students of the science

loses identity with the method in our ordinary academic classes. It is maintained that an adult performing a new function brings forward the same conscious experience to the action which the child enjoys; yet, the author holds that there are successive levels of physical and mental development, by reason of which the child lives a different life—a series of positions which are not perfectly clear to us. In the last three or four chapters the author grows more friendly towards the genetic constituents of the child, which leads one to believe that "teacher-study" may be more of a convenient fiction for exposition than a solid reality for a new "science." On another point teachers will repeatedly inquire: What does the author mean by "complete development," reference to which increases in frequency in the latter part of the work as a standard for gauging the growth of specific functions, and the merits of special methods of instruction? Does it mean the adult of to-day? If so, the application of the idea of development is inconveniently cut off just at the point of its greatest usefulness to educational theory.

The author presents his facts and conclusions in a style that is interesting and forceful. Good summaries and an index add to the usefulness of the volume, which lends, fortunately, an unusually solid merit to the Series in which it appears.

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IX

NOTES AND NEWS

Mr. Mosely's British Educational Commission

The Commission of Inquiry into the educational systems of the United States in their bearing upon national commerce and industry, projected last year by Mr. Alfred Mosely, C. M. G., but postponed owing to the unsettlement in this country over the Educational Bill, will start from Southampton on October 3, Mr. Mosely himself preceding it by two or three weeks to make arrangements for its reception. As will be seen from the names of those who have accepted invitations, no pains have been spared to make the Commission as representative as possible of educational interests in England. Mr. Mosely's aim has been to secure the co-operation, not only of trained students of education and men intimately connected with its administration in all branches, but also of men of light and leading in the more important centers of commercial, industrial, and intellectual life. Such men, he feels, will hereafter be in a position, as members of municipal or educational bodies, to recommend to their fellow-citizens ideas which have struck them as worth noting, thus contributing to the realization of what we so badly need—a well-organized, up-to-date system of national education that may enable English commerce to hold its own in the fierce industrial competition that has overtaken, and threatens partly to overwhelm it. Opinions may differ as to the real causes of our present industrial situation, as to how far we are justified in pessimistic views of the future, or as to the extent to which defective education is responsible for such shortcomings as are patent to all observers. But there are facts which no policy of *laissez-faire*, no insular self-satisfaction, no *laudatio temporis acti* can ignore. The startling growth of American and German industrial competition is a fact, and a daily more alarming fact. Closely connected with it, and in the opinion of many keen observers largely responsible for it, is the fact that these

are precisely the two countries in which national education of all grades has made the greatest strides, and in which its importance is most widely recognized by the people at large. This cannot as yet be said of England. Much has, no doubt, been done of late years to make up for lost ground, but much more remains to be done, especially in secondary education, and upon its technical and commercial side, to equip our citizens for their various work in life; and the leaders of commerce are beginning to realize this. Mr. Mosely is not the only Englishman of wide commercial experience who has come to the conclusion that one main *desideratum* is better education and more of it; nor is he the first to whom the promotion of education has seemed a worthy application of wealth gained in commercial pursuits. Our rich men do not, indeed, come forward as American millionaires do for the support of education. But we can point to such instances as the founder of Mason College, or more recently to Mr. Mosely's friend Cecil Rhodes, with whom he has talked in South African days about the use of wealth for carrying out great ideas. And it may be hoped that Mr. Mosely's own idea of collecting by trustworthy inquiry, and then endeavoring to diffuse among his countrymen, information as to the principles and practice of successful educational work elsewhere may be equally fruitful of results. Whatever those results may be, it is a generous and a patriotic scheme.

The itinerary of the Commission, drawn up with the assistance of President Butler of Columbia University, New York, embraces most of the leading educational centers in the United States. In New York itself visits will be paid to the Columbia University, to typical high schools, elementary schools, and manual-training classes, the Ethical Culture schools, and the Normal (Training) College. Thence to New Haven, Conn., to visit Yale University and typical manufacturing establishments. Next comes Boston, with visits to Harvard University, the Massachusetts Institute of Technology, and various typical schools. Then Philadelphia, where there is much of educational interest—the University of Pennsylvania, with the school of higher commercial education, the Drexel Institute, Girls' Normal school, etc.; and

Baltimore, with the comparatively recent, but widely known, Johns Hopkins University. From Baltimore the Commission will proceed to Washington; thence to Pittsburg, the seat of the great steel industry associated with Mr. Carnegie; and on to Chicago, some of whose educational institutions are almost as famous as its stock-yards, grain elevators, and other appliances of commercial wealth; Ann Arbor, to visit a typical State University. Detroit, Niagara Falls, Ithaca (for Cornell University), Schenectady, and Albany are also on the program, with possibly, for some of the party, an extension to California. It is not, we understand, contemplated that the whole of this varied program will be undertaken by the Commission *en masse*. The work will be to some extent subdivided, and so organized that its different members shall see, and afterwards report upon, aspects of educational work in which they are specially interested, or on which they are specially qualified to form an opinion. This may lead, after a time, to some division of the party, and the return of certain of its members before others. But, at any rate, during the early part of the tour the Commissioners will be together and act as one body.

Mr. Mosely, we understand, does not contemplate the issue of a formal joint report, after the manner of a Royal Commission. But each member of the commission will be invited to record his own impressions, or to combine, if he prefers it, with others interested in the same subjects of education. In this way it is thought that greater elasticity will be secured, and more varied light brought to bear upon all the points in American education that are likely to be interesting or useful here. The reports will then be printed in a volume or volumes, and distributed to educational bodies thruout the United Kingdom. At this stage we need not attempt to forecast the results of this inquiry, or the direction that it will take in matters of detail. From what has been said above, it should prove of great interest and help not only to those engaged in it, but to the whole country, now feeling its way thru much dimness and uncertainty towards a sound system of national education. Nor can we speak too warmly of the patriotic spirit which has led a single citizen, not professing

expert knowledge of education, to undertake, at his own personal cost, a public service which we fear no British Government would yet venture to charge upon the national revenues.

The following is a list of the Commissioners, according to the latest arrangements:

Arthur Anderton, Esq., J. P., alderman and chairman of the Technical Instruction Committee of the West Riding County Council. (Nominated by the County Councils Association.)

Henry E. Armstrong, Esq., LL. D., Ph. D., V. P. C. S., Professor of Chemistry in the City and Guilds of London Institute.

W. E. Ayrton, Esq., F. R. S., Professor of Physics in the Central Technical College, past president of the Institution of Electrical Engineers.

Thomas Barclay, Esq., LL. B., Ph. D., late president of the Paris Chamber of Commerce.

A. W. Black, Esq., J. P., Mayor of Nottingham, chairman of the Nottingham Education Committee.

R. Blair, Esq., M. A., B. Sc., assistant secretary for Technical Instruction of the Department of Agriculture and Technical Education of Ireland. (Nominated by the Department of Agriculture and Technical Education, Ireland.)

J. Rose Bradford, Esq., M. D. Lond., F. R. C. S., F. R. S., Professor of Medicine, University College, London.

G. J. Cockburn, Esq., late chairman of Leeds School Board.

The Right Rev. the Bishop of Coventry, late chairman of the Birmingham School Board.

H. Coward, Esq., president of the National Union of Teachers. (Nominated by the National Union of Teachers.)

The Rev. Professor Finlay, S. J., F. R. U. I., member of the Intermediate Education Board and the Technical Education Board, Ireland, Professor of Political Economy, University College, Dublin. (Nominated as official representative of the Board of Agriculture and Technical Education of Ireland.)

T. Gregory Foster, Esq., B. A., Ph. D., Assistant Professor of English in University College, London, and secretary to the college.

W. C. Fletcher, Esq., M. A., late Fellow of St. John's College, Cambridge, headmaster of the Liverpool Institute, Liverpool.

Percy Falkland, Esq., Ph. D., B. Sc., F. R. S., Professor of Chemistry in the University of Birmingham.

W. H. Gaskell, Esq., M. A., M. D., F. R. S., Fellow of Trinity Hall, Cambridge, University Lecturer in Physiology.

The Rev. H. B. Gray, D. D., Oxford, Warden of Bradfield College.

W. P. Groser, Esq., of the Inner Temple, representing the Parliamentary Industry Committee, and to inquire into legal education.

C. J. Hamilton, Esq., B. A. Camb., F. S. S., Lecturer on Political Economy, University College, Cardiff (Secretary to the Commission).

J. R. Heape, Esq., chairman of the Rochdale Technical School.

The Rev. A. W. Jephson, M. A., member of the London School Board.

W. Jones, Esq., M. P. for Arfon Division of Carnarvon, representing the Parliamentary Industry Committee.

Magnus Maclean, Esq., M. A., D. Sc., Professor of Electrical Engineering in the Glasgow and West of Scotland Technical College, Glasgow. (Nominated official representative by (1) the Glasgow and West of Scotland Technical College; (2) the Edinburgh School Board; (3) the Technical and Secondary Education Committee of the Ayrshire County Council.)

The Rev. T. L. Papillon, M. A., vicar of Writtle, Essex, late Fellow and tutor of New College, Oxford, formerly Fellow of Merton College.

Herbert R. Rathbone, Esq., B. A., Barrister-at-law, member of the Education Committee and deputy-chairman of the Committee on Elementary Education, Liverpool.

H. R. Reichel, Esq., LL. D., late Fellow of All Souls, Oxford, Principal of University College of North Wales, Bangor, and member of the Welsh Intermediate Education Board. (Nominated as official representative of University colleges of Cardiff, Aberystwith, and Bangor.)

John Rhys, Esq., LL. D., Professor of Celtic in the University of Oxford, member of the British Academy, member of the Oxford Education Committee (some time H. M. Inspector of Schools).

W. Ripper, Esq., M. I. C. E., Professor of Engineering in University College, Sheffield, member of the Sheffield Education Committee.

Sir Albert Kaye Rollit, LL. D., D. C. L., M. P., vice-president of the London Chamber of Commerce. (Nominated by the Association of Municipal Corporations.)

Charles Rowley, Esq., M. A., J. P., member of the Manchester Education Committee and of the Manchester School of Technology, chairman of the Manchester School of Art.

A. J. Shepheard, Esq., chairman of the Technical Education Board of the London County Council.

Arthur Edmund Spender, Esq., B. A. Oxon, Barrister-at-law, director of Plymouth Girls' High School, member of Plymouth Chamber of Commerce Executive, and of the Mount-Edgcumbe industrial training ship, representing Plymouth.—*The Times* (London), August 17, 1903.

Dr. George E. Vincent, principal of the original Chautauqua Assembly, at Chautauqua, N. Y., has written to the Boston *Herald* to correct a false impression due to some remarkable performances last summer at so-called "Chautauqua Assemblies" held at various points in the Middle West. He says:

Chautauqua Institution has no connection with any of the seventy-five or eighty Chautauquas scattered thruout the country. It has no control over them. A few of these assemblies are conducted in a creditable and dignified manner. Many of them are "trolley end" enterprises or expurgated street fairs. The word chautauqua as a geographical name cannot be copyrighted or protected in any way. Many of the sensational undertakings of these assemblies are a source of humiliation to those who have built up the Chautauqua Institution.